DEVOTED TO
TEXTILE
WET-PROCESSING
•
CHEMISTRY
BLEACHING • DYEING
PRINTING • FINISHING

NOVEMBER 29, 1948
VOLUME 37, NO. 24

AMERICAN DYESTUFF REPORTER

For a wide range of grays . . .
very good light fastness

DEC 3

PONSOL GRAY R PASTE
Reg. U. S. Pat. Off.

NEW anthraquinone vat color of outstanding fastness produces gray shades of a neutral tone. Suitable for dyeing cotton and viscose-process rayon in all stages of manufacture . . . for shirtings, uniform cloths, draperies, dress goods, and other fabrics where good fastness to light and laundering is required. Can be applied by pigment pad and reduced methods of dyeing in all types of machines and by the Du Pont Pad-Steam Continuous Dyeing Process. Reduces easily . . . exhausts uniformly. E. I. du Pont de Nemours & Co. (Inc.), Dyestuffs Div., Wilmington 98, Del.

Du Pont Dyestuffs

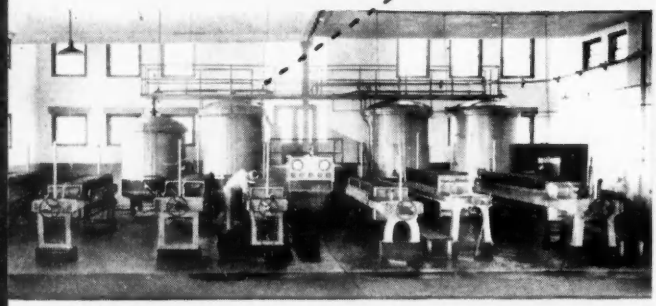
DU PONT

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

OFFICIAL PUBLICATION
of the
PROCEEDINGS
AMERICAN ASSOCIATION
OF TEXTILE CHEMISTS
AND COLORISTS

this
tiny
dot
of
rust . . .

could contaminate hundreds of pounds of the finest dyestuffs, causing spots on the finished dyed fabric. Althouse PRECISION Dye-Making *eliminates* this "Dyers' Enemy Number One" . . . CONTAMINATION!



Non-corrosive, modern presses, plus specially-built equipment (even down to the trucks) are used so that our dyestuffs NEVER come in contact with *any* Corrosive Metals while in the wet stage. This is just another example of the many steps taken in Althouse PRECISION Dye-Making . . . to assure you of "uniformity" in every shipment of ALTCO dyestuffs, today and always!

pace-setter in precision dye-making

ALTHOUSE
Chemical Company, Inc.
READING · PA.

PERMA - PAR R

An improved cation action finish

RESISTANT TO WASHING & DRY CLEANING

REFINED PRODUCTS CORPORATION

Lyndhurst, New Jersey

Manufacturers of PERMA-CIDE, the approved, outstanding, mildew-proofing agent

Southern Representative: DYER S. MOSS, 5301 Liberty Life Bldg., Charlotte, North Carolina

New England Representatives: E. L. LEGG, P. O. Box 507, Providence, R. I.
CLARENCE E. MOSS, 19 Wilson Ave., Rumford (96), R. I.
CARBIC COLOR & CHEMICAL CO., INC., 48 Pine St., Providence, R. I.

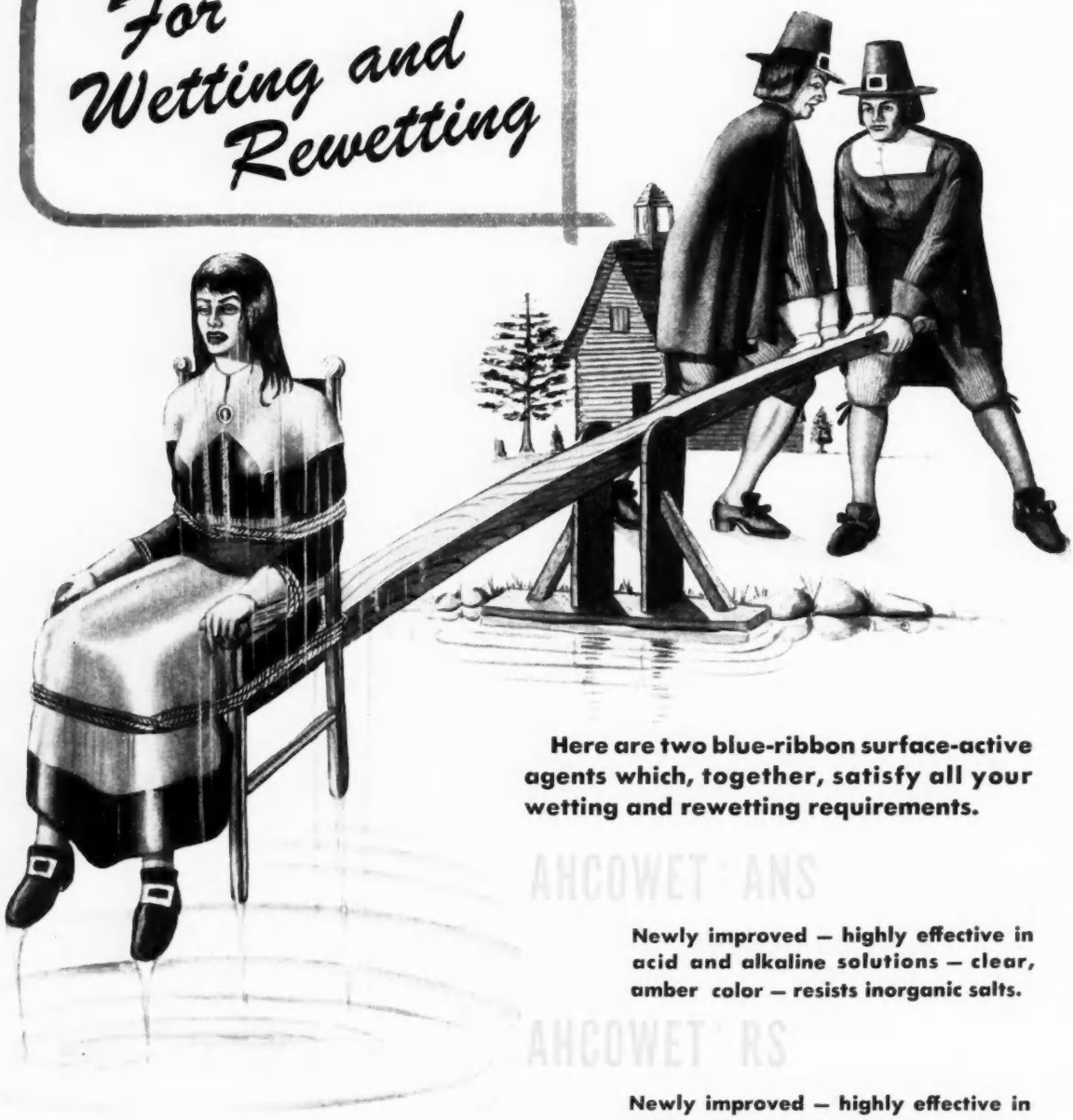
California Representative: SIDNEY SPRINGER, 2360 S. Vermont Ave., Los Angeles 7, California

Canadian Selling Agents: Carbic Color and Chemical Co., Inc., 56 McNab Street South, Hamilton, Ontario

Exporting Agents: Chem-Cid Company, 82 Wall St., New York City

AHCOWET* ANS AND AHCOWET* RS

For Wetting and Rewetting



Here are two blue-ribbon surface-active agents which, together, satisfy all your wetting and rewetting requirements.

AHCOWET* ANS

Newly improved — highly effective in acid and alkaline solutions — clear, amber color — resists inorganic salts.

AHCOWET* RS

Newly improved — highly effective in acid and neutral solutions — clear, golden color — resists inorganic salts — ideal for rewetting.

Samples and further data on request

*Trademark Registered

ARNOLD, HOFFMAN & CO. INCORPORATED

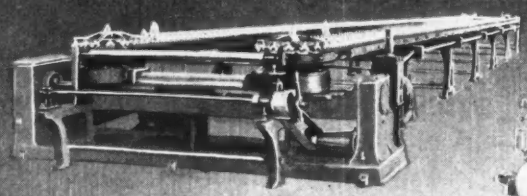
MANUFACTURING CHEMISTS

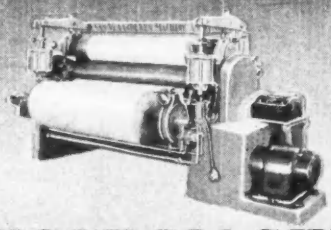
ESTABLISHED 1815 • PLANTS AT DIGHTON, MASS. AND CHARLOTTE, N. C.

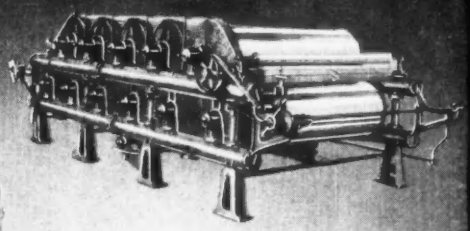
PROVIDENCE, RHODE ISLAND

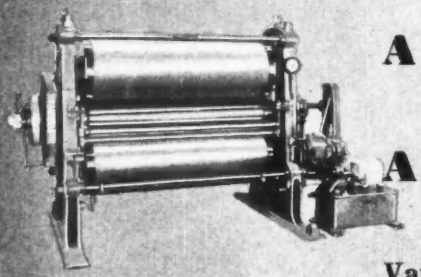
NEW YORK • BOSTON • PHILADELPHIA • CHARLOTTE

American Dyestuff Reporter, Vol. 37, No. 24. November 29, 1948. Published every other Monday. Copyright, 1948, by Howes Publishing Co., Inc., One Madison Ave., New York 10, N. Y. Domestic subscription, $5.00; Canadian, $6.00. Foreign, $10.00. Entered as second-class matter, Nov. 6, 1919, at the New York, N. Y., Post Office, under the act of March 3, 1879.

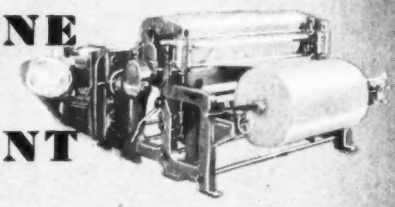






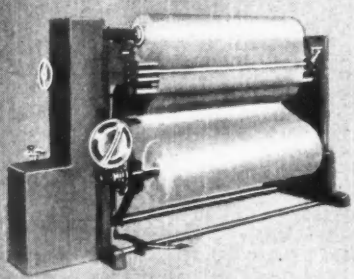


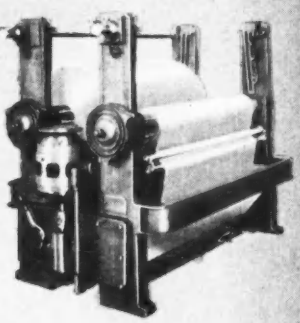
A SINGLE MACHINE OR AN ENTIRE PLANT

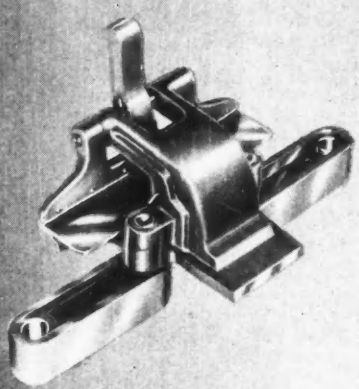


Van Vlaanderen engineers are prepared to help you design a complete dyeing and finishing plant — or will help you select a single machine to meet a special need.

The Van Vlaanderen equipment you buy now will be better too — giving greater production and higher quality in processing modern fabrics.



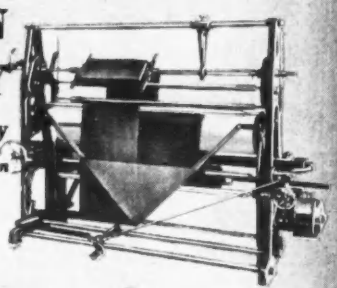


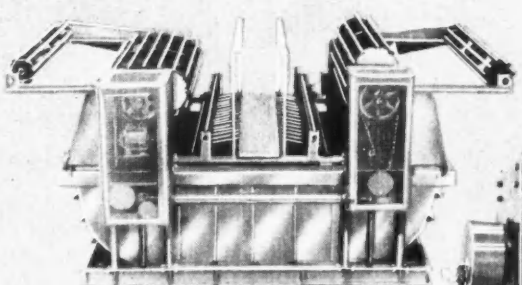


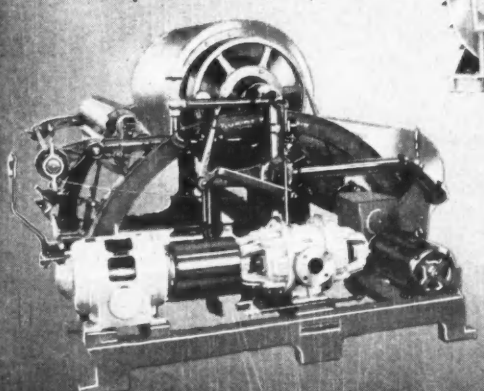
VAN VLAANDEREN MACHINE COMPANY

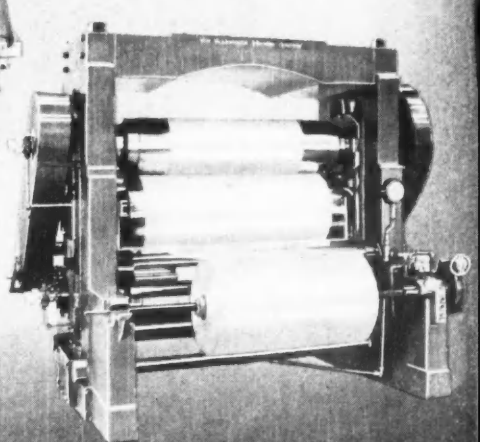
370 Straight Street, Paterson 3, New Jersey

World's largest manufacturer of machines for processing modern fabrics









Henri says . . .

"WAPACO Wool Oil B ees ma cheri. She save my *CHIPPEWA FALLS WOOLEN MILL* much money and much time. Ze reasons?"

WAPACO WOOL OIL B:

1. Gives us CONTINUAL HIGH YIELDS OFF CARD.
2. Eliminates GUMMING of Card Wire and Pitting.
3. Assures SCOURABILITY . . . using less soap and doing a superior job.
4. Allows EXACT ESTIMATE OF PRODUCTION. We process 1500-2500 pounds without stripping cards.
5. Eliminates OXIDATION.
6. Can BE LEFT AROUND INDEFINITELY IN THE GREASE.
7. Produces LESS ENDS DOWN AT THE RUB APRON . . . for more uniformity.
8. PENETRATES . . . does not lie on the surface.
9. MIXES IN HARDEST OF WATERS . . . hot or cold.
10. Allows FIRST BREAKER TO STRIP AS EASILY AS FINISHING BREAKER. Also will strip to base of the wire on all breakers, doffers, workers and strippers.

A *Watson-Park* DEMONSTRATOR WILL BE GLAD TO DISCUSS YOUR PROBLEMS WITH YOU. OR WRITE FOR FURTHER INFORMATION.

WATSON-PARK CO. Wapaco Leads BOSTON, MASS.

FACTORY, LOWELL JCT., MASS.

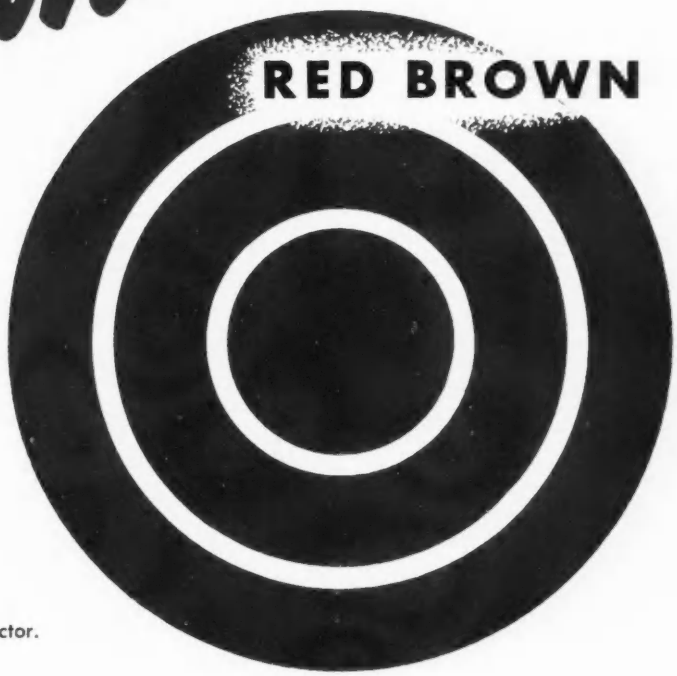
WATSON-PARK COMPANY

261 FRANKLIN STREET BOSTON, MASS.

AMANTHRENE* VAT COLORS
provide the answer to the demand for
better color fastness in textiles

Amanthrene

RED BROWN



in double paste or
double powder form

An excellent base color for deep chocolate browns and a shading element for taupes and tans where fastness to light, washing, chlorine and perspiration is a factor.

Satisfactorily meets the requirements for slip cover materials, upholstery fabrics, sports wear, and men's work clothes.

Suitable for cotton and rayon yarn in warp, beam and package dyeing equipment, as well as for skein work and hosiery. Well adapted, also, to jig and pad-jig dyeing of piece goods.

Another of the Amanthrene range of superior vat colors. For detailed information on the whole range available, as well as data regarding your own particular requirements, consult our nearest branch. A.A.P. technicians are always happy to be of service.

AMERICAN ANILINE PRODUCTS, INC., 50 Union Square, New York, N. Y. • ***Plant:*** Lock Haven, Pa.
Branches: Boston, Mass. • Providence, R. I. • Philadelphia, Pa. • Charlotte, N. C. • Chicago, Ill. • Los Angeles, Cal.
Chattanooga, Tenn. • **Dominion Anilines & Chemicals Ltd.** • Toronto, Canada • Montreal, Canada

*Reg. U.S. Pat. Off.

IF YOU WANT

DURABLE *Softness*

Paramine TA is the modern cationic finish for acetate, viscose, cotton and mixed fibres. Mills using paramine TA for dress goods, glove fabrics, tricot and other types of knitted materials have found this finish offers added sales appeal.

Thorough penetration of Paramine TA assures a softness within the yarn itself that gives materials a full hand and desirable drape—its substantive action produces a durable, lasting finish

—Application is simple.

Use Paramine TA

*Reg. U. S. Pat. Off.

WRITE FOR DETAILS OR DEMONSTRATION

Arkansas Co. INC.

Manufacturers of Industrial Chemicals for Over 40 Years

NEWARK, NEW JERSEY

When new textiles or new finishes require
new dyestuffs or application techniques

ALWAYS SPECIFY

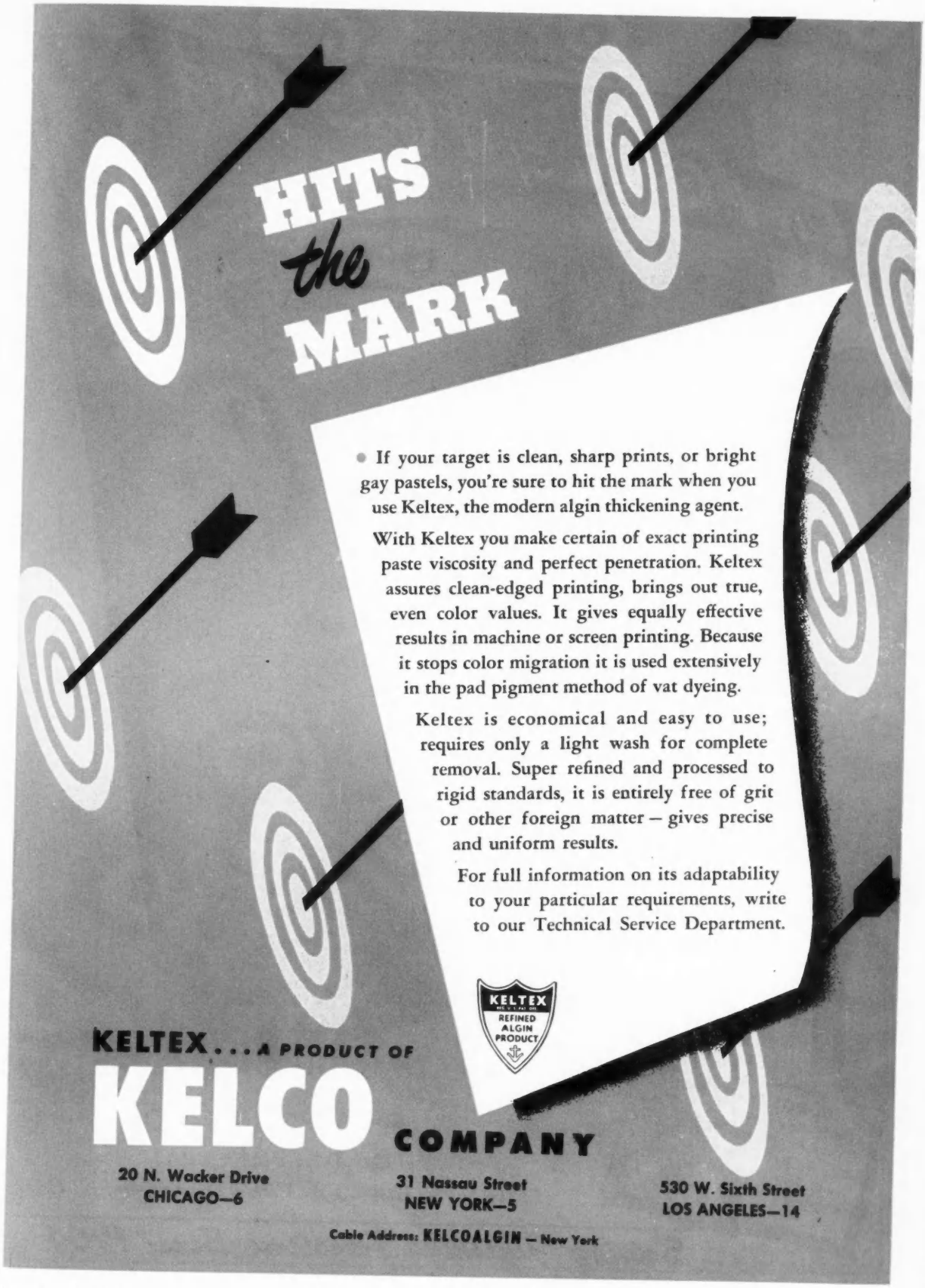
National Aniline Dyes

NATIONAL ANILINE DIVISION • ALLIED CHEMICAL & DYE CORPORATION

40 RECTOR STREET, NEW YORK 6, N.Y.

BOSTON • PROVIDENCE • PHILADELPHIA • CHICAGO • SAN FRANCISCO • PORTLAND, ORE.
GREENSBORO • CHARLOTTE • ATLANTA • NEW ORLEANS • CHATTANOOGA • TORONTO

Novemb


HITS
the
MARK
If your target is clean, sharp prints, or bright gay pastels, you're sure to hit the mark when you use Keltex, the modern algin thickening agent.
With Keltex you make certain of exact printing paste viscosity and perfect penetration. Keltex assures clean-edged printing, brings out true, even color values. It gives equally effective results in machine or screen printing. Because it stops color migration it is used extensively in the pad pigment method of vat dyeing.
Keltex is economical and easy to use; requires only a light wash for complete removal. Super refined and processed to rigid standards, it is entirely free of grit or other foreign matter – gives precise and uniform results.
For full information on its adaptability to your particular requirements, write to our Technical Service Department.
KELTEX
REFINED ALGIN PRODUCT
KELTEX . . . A PRODUCT OF
KELCO COMPANY
20 N. Wacker Drive
CHICAGO—6
31 Nassau Street
NEW YORK—5
530 W. Sixth Street
LOS ANGELES—14
Cable Address: KELCOALGIN — New York

On Him the spot looks Good

A spot, more or less, doesn't mean much to a leopard . . . With hosiery, it's different . . . the spotlight's sudden glare may show up sheer hose that just isn't dull. Because it's no small matter to impart lasting dullness to many of today's new yarns, Fancourt Chemists have spent hours working with many of the country's leading mills to develop new finishes for new yarns. A Fancourt field man will be glad to tell you all about the successful results of this work.

Perhaps, too, he can help you improve your hosiery's appearance.

DOROTHY DUNNE

This month's Fancourt girl says, "Speaking of spots . . . a girl's legs are on the spot most of the time. Hosiery that shines like a spotlight doesn't count in her favor."

W. F. FANCOURT CO.

PHILADELPHIA, PA.

In the South, Howard A. Virkler, Greensboro, N. C.

Solving Finishing Problems Since 1904

An Important
Synthetic Resin Announcement
For the Textile Industry

The
Atlantic Chemical Co.
INCORPORATED

CENTREDALE, RHODE ISLAND — PATERSON, NEW JERSEY

Has been Appointed
Exclusive Eastern Representative

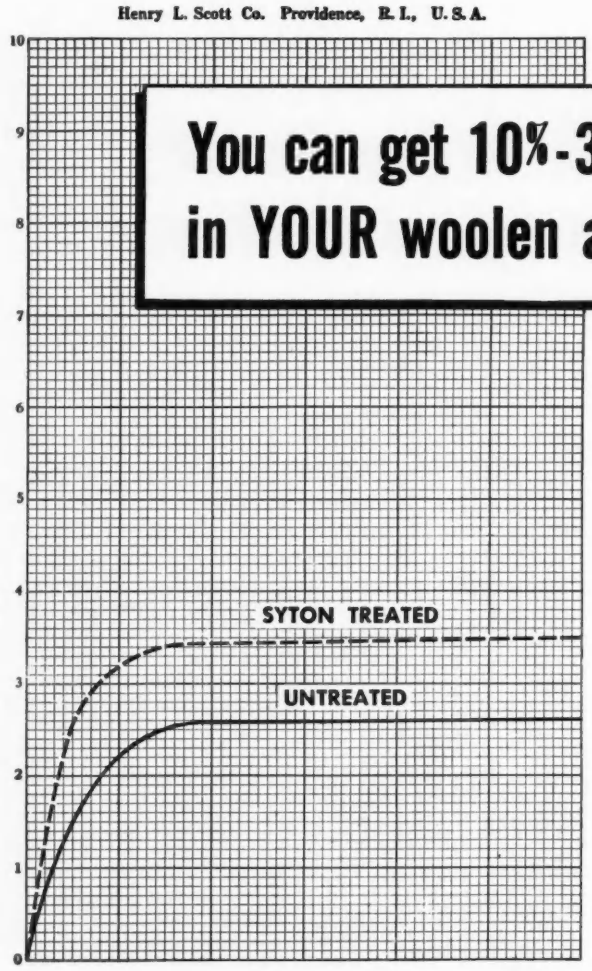
for

REICHHOLD CHEMICALS, INC.

"World's Largest Producer of Synthetic Resins"
DETROIT, MICHIGAN

For The Sale and Distribution
of
REICHHOLD SYNTHETIC RESINS
For Textiles

FOR YOUR INFOR[M]ATION



You can get 10%-30% more yarn strength in YOUR woolen and worsted spinning

You can *measure* the results of Syton* in a laboratory and show increased yarn strength up to 30%. But an even *better* measurement is Syton's performance in the field. More and more mills are using this Monsanto-developed product. They're getting performance that's paying off for them. Performance that will pay off for you. Just check the coupon at 1 to get full information or technical help at your plant. And, meantime, look at the advantages that stem from added yarn strength.

FASTER PRODUCTION: Because of increased yarn strength, the amount of twist can be reduced and production thereby speeded.

LOFTIER YARNS: Less twist means loftier yarns, with tensile strength equal or better than the strength of untreated yarns of higher twist.

FINER YARNS WITH ALL GRADES: Higher counts—closer to limit spin—for most grades of stock can be attained with Syton-treated yarns.

FEWER ENDS DOWN: Reductions in ends down vary from 25% to 50% depending on the grade of wool.

BETTER SPINNING EFFICIENCY: Syton produces more uniform yarn with less beard and thin spots, reduced fly waste, and better drafting.

STYMER

STOPS static electricity troubles in acetate weaving

Just *one* of Stymer's* many advantages: Elimination of static electricity so troublesome during acetate weaving! Monsanto's Stymer has a high conductivity . . . at least 400 times that of gelatine or starch! The Stymer film is exceptionally strong, smooth, flexible and abrasion resistant. Actual mill experience has already proved the tremendous, practical success of this new invention of Monsanto research.

THINK OF ALL THESE ADVANTAGES IN YOUR MILL:

1	**FILM IS** exceptionally strong, tough, abrasion resistant, smooth and flexible.	3	**ADHERES** well to the fiber.
		4	**EASY TO SCOUR** from the woven fabric in warm water containing a detergent.
2	**EASILY APPLIED** in a uniform coating on the individual yarn.	5	**REDUCES STATIC.**

IN SLASHING, Stymer does not stick to uncovered dry cans, stops static electricity, separates easily at the lease rods and does not gel in the pipes or size box.

IN WEAVING, the Stymer-sized warps exhibit little or no shedding, maintain yarn twist, have fewer end breaks and produce a more uniform fabric.

And . . . last but certainly not least . . . Stymer's in a competitive cost range with other acetate sizes! Just check the coupon at 2 for more information.

*Reg. U. S. Pat. Off.

MONSANTO
CHEMICALS for PLASTICS

SERVING INDUSTRY . . . WHICH SERVES MANKIND

MONSANTO CHEMICAL COMPANY, TEXTILE CHEMICALS DEPARTMENT
Desk No. ADT-12, 140 Federal Street, Boston 10, Mass.

Please send me information on the following subjects as covered in your advertisement. ☐ *1,* ☐ *2.*

Name _____ Title _____

Company _____

Address _____

City _____ State _____

Valuable additions to our line of . . .

Pharmasols*

Brown 2G produces a bright yellow Brown of excellent fastness to washing at a low cost.

Brown R produces a warm Brown of general all-around fastness.

Seal Brown yields a deep Brown at low cost and is of good all-around fastness.

THE THREE NEW BROWNS PRODUCE DESIRABLE TAN SHADES WHEN PRINTED IN REDUCED STRENGTH

THESE NEW BROWNS,

especially Seal Brown and Brown R, are easy to apply and show a very pronounced improvement in their

FASTNESS TO LIGHT

against our former Browns

*REG. U. S. PAT. OFF.

CARBIC COLOR AND CHEMICAL CO., INC.

451-453 Washington Street, New York City

BRANCHES:
PHILADELPHIA
PROVIDENCE HAMILTON, ONT.
CHARLOTTE, N. C.

IMPORTERS OF THE MANUFACTURES OF
DURAND & HUGUENIN S. A.
BASLE, SWITZERLAND

EXCLUSIVE DISTRIBUTORS OF
PHARMASOLS
PHARMOLS
PHARMACINES

Representative: Los Angeles (Hathaway Allied Products)

AMERICAN

DYESTUFF REPORTER

LOUIS A. OLNEY, D.Sc.
Directing Editor

NORMAN A. JOHNSON, B.T.C.
Managing Editor

MYRON D. REESER
Advertising Manager

GRACE B. BURTON
Production Manager

M. H. MORGAN
Circulation Manager

Official Publication of the Proceedings of the American Association of Textile Chemists and Colorists

•

Published every other Monday by
HOWES PUBLISHING COMPANY, INC.
One Madison Avenue, New York 10, N. Y.

LOUIS A. OLNEY
President

C. R. HOWES
Vice President

H. F. CRAWFORD
Treasurer

M. D. REESER
Secretary

C. ESSENBREIS
Asst. Secretary

•

Also Publishers of
HOSIERY INDUSTRY WEEKLY
TEXTILE COLORIST
AND CONVERTER
HOSIERY MERCHANDISING

•

NOVEMBER 29, 1948
VOLUME 37 NUMBER 24

Contents

Contents of previous issues can be found by consulting the Industrial Arts Index and the Engineering Index, Inc. at your library

• Departments

Trade Notes—New Products..... 799

• Proceedings of the American Association of Textile Chemists and Colorists

The Augusta Convention in Pictures.....P773

Calendar P777

One Hundred and Sixty-fourth Council Meeting...P778

Membership Applications.....P779

Recent Visitor to AATCC Headquarters.....P779

Report, North Carolina State College Student Chapter P779

Report, Bradford Durfee Technical Institute.....P779

Employment Register.....P779

One Hundred and Fifty-fifth General Research Committee Meeting P780

One Hundred and Fifty-sixth General Research Committee Meeting P782

December 3rd Meeting, WNE Section.....P784

Auxiliary Products in Dyeing.....P785
Hector C. Borghetty

December 4th Meeting, SE Section.....P787

Intersectional Contest
Vocational Texts in Practical Wet Processing...P788

South Central Section

Report PTI Student Chapter.....P798

Report LTI Student Chapter.....P798

Copyright, 1948, Howes Publishing Co., Inc

For the Ultimate Sales Touch . . .

ETERNALURE

RESIN FINISH FOR NYLONS

If the only factor in nylon sales was the finish, the shops that featured Eternalure-treated hose would get a lion's share of the business.

Finish is only part of the picture, of course, but it's a mighty important part. When you use Eternalure you get a finish of dainty, smooth beauty. You get practical user-benefits that mean repeat buying because SHE remembers the brands that give her long service. SHE will demand the better snag-resistance, the smoother fit, the satisfying "feel" of Eternalure-finished hose.

Remember, however, that before your nylons reach the sales counter, Eternalure assures a real savings for you in smoother, better quality production.

Hose finished with Eternalure have well clarified, properly tightened stitch. Hose are easier to handle, with pull threads at a minimum. There are no chalky deposits caused by uneven deposition.

Eternalure offers you better selling nylons at lower over-all production costs, without changes in operation or equipment.

Give Eternalure a mill-scale tryout, followed by a complete break-down in the finishing department, and prove for yourself its advantages.

ONYX OIL & CHEMICAL COMPANY

JERSEY CITY 2, N. J.

CHICAGO • PROVIDENCE • CHARLOTTE • ATLANTA

In Canada: Onyx Oil & Chemical Co., Ltd., Montreal, Toronto, St. Johns, Que.
For Export: Onyx International, Jersey City 2, N. J.

onyx RESIN FINISHES FOR HOSIERY

Proceedings of the

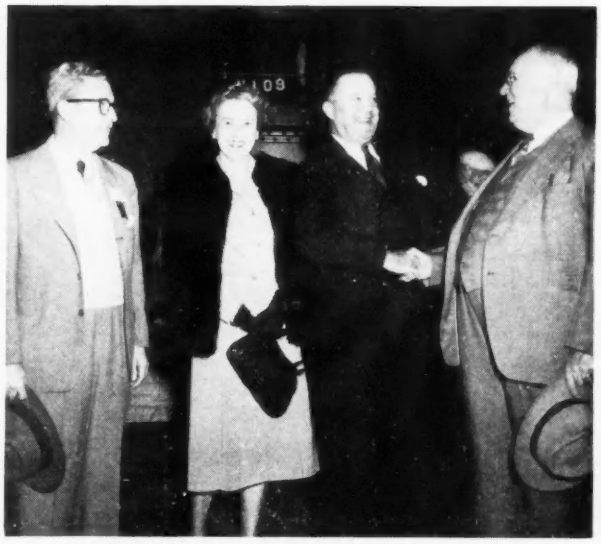
American Association of Textile Chemists and Colorists

Copyright, 1948, American Association of Textile Chemists and Colorists

NOVEMBER 29, 1948

THE AUGUSTA CONVENTION IN PICTURES . . .

THE PRESIDENT AND PARTY ARE WELCOMED ON ARRIVAL IN AUGUSTA: left to right, D. C. Newman, General Chairman of the Convention, Henry F. Herrmann, National President, Mrs. Herrmann, J. Robert Bonnar, Chairman of the General Research Committee, S. H. Williams (back to camera).

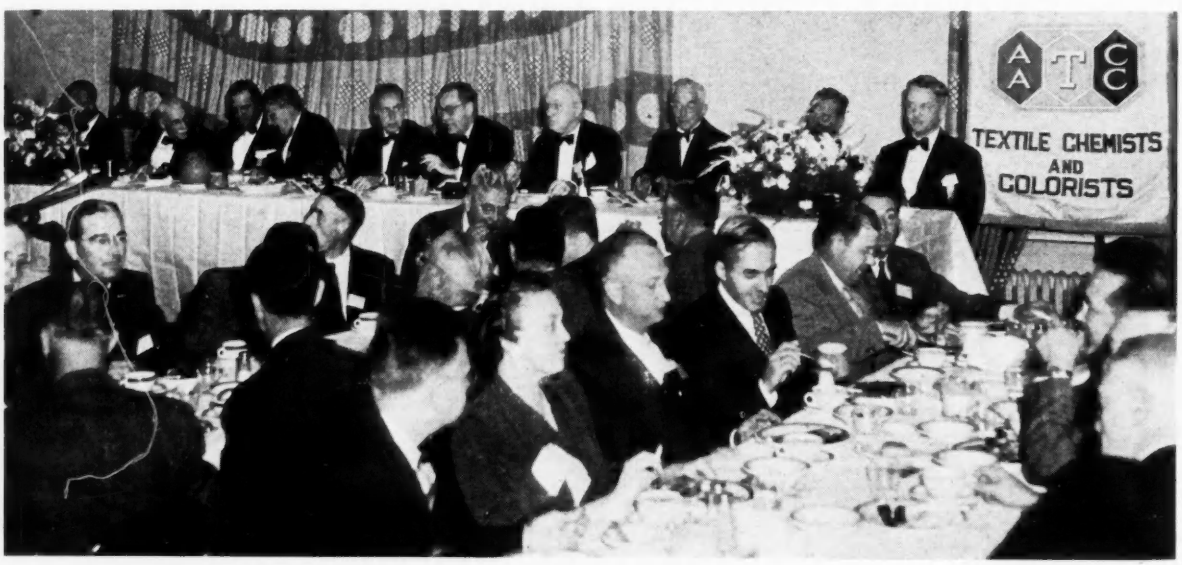


GREETINGS FROM THE MAYOR AT AUGUSTA STATION: left to right, J. A. Franklin, Assistant General Chairman of the Convention, Mrs. Herrmann, Mr. Hermann, and W. D. Page, Mayor of Augusta

SCENE AT REGISTRATION DESK IN LOBBY AT SHERATON BON AIR

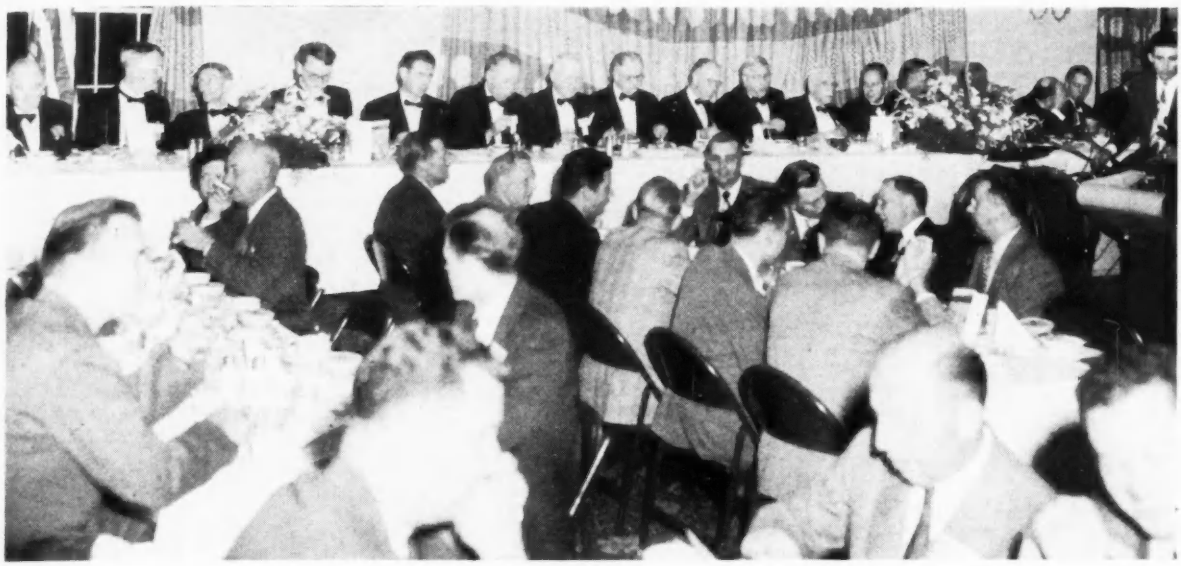
THURSDAY EVENING DINNER: Basil D. Browder, Vice-President and Assistant to the President of Dan River Mills, Inc., entertains with a song.

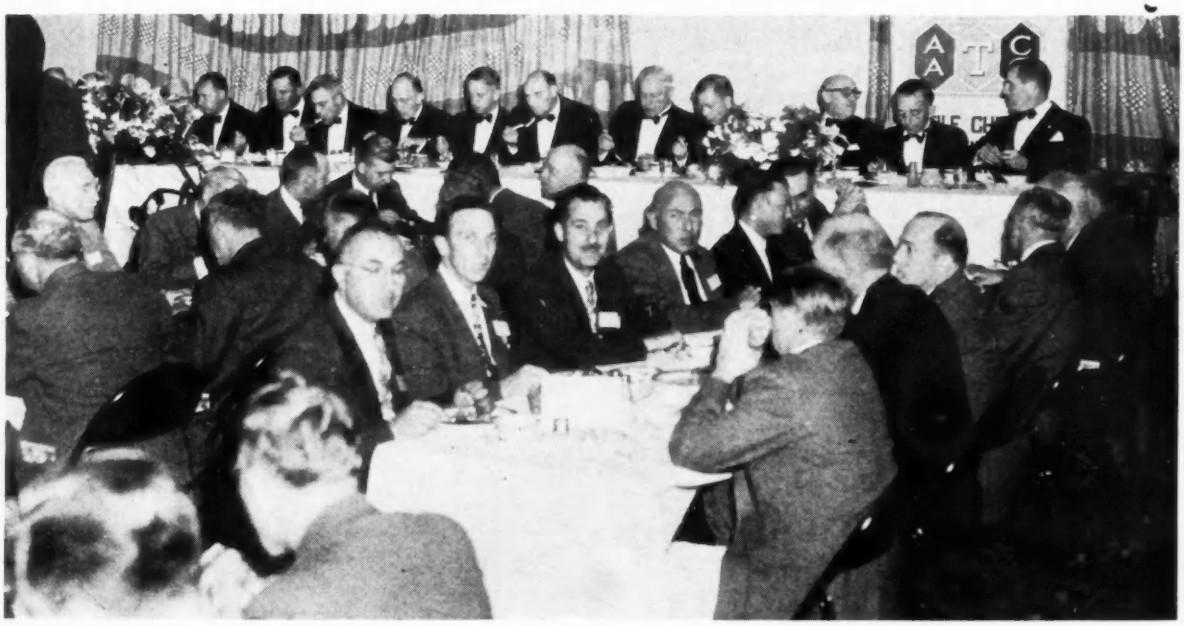
HEAD TABLE AT THURSDAY EVENING DINNER . . .



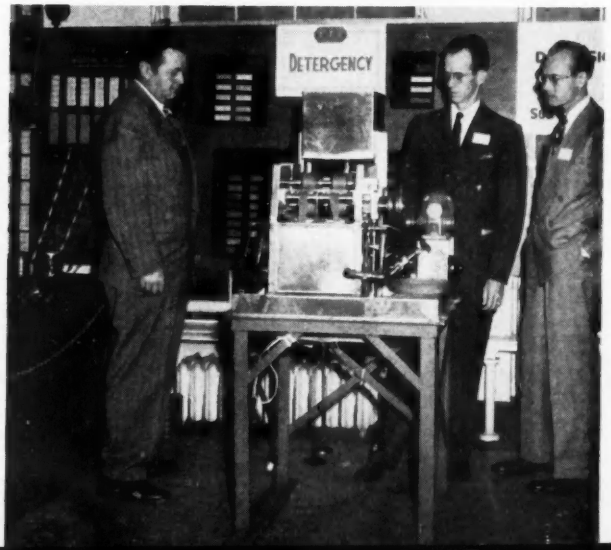
EXHIBITS . . .

HEAD TABLE AT FRIDAY EVENING DINNER . . .

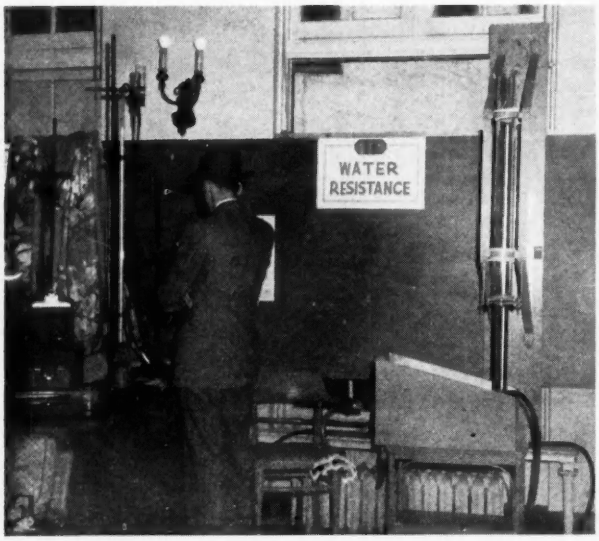




EXHIBITS . . .



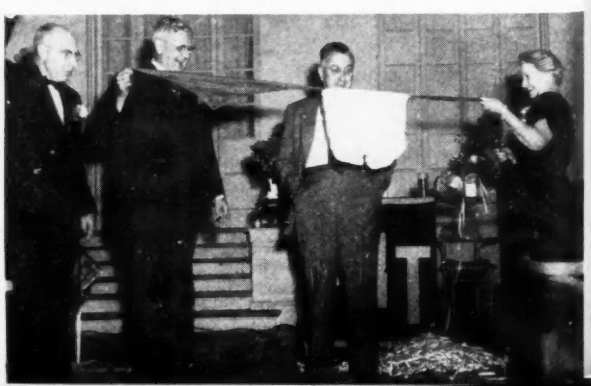
EXHIBITS . . .



OLNEY MEDAL PRESENTATION: Henry F. Herrmann, President, presents Olney Medal to Harold M. Chase at Thursday evening dinner.

LOOKING OVER THE PROGRAM: D. C. Newman, General Convention Chairman, and J. A. Franklin, Assistant Chairman, examine the attractively printed Convention Program.

SOME OF THE MEMBERS OF THE LADIES' COMMITTEE SURROUND THEIR CHAIRMAN: left to right, Mrs. Curt Mueller, Mrs. Laurie E. Whittelsey, Mrs. J. Lindsay Wyman, Mrs. Sherman A. Converse, Mrs. R. P. Timmerman, W. B. Griffin, Chairman, and Mrs. Z. Boyce Mangum, Assistant Chairman.



LADIES' BANQUET, FRIDAY EVENING: P. G. Wear and Mrs. S. I. Parker assist Magician Art Thompson in a bit of sleight-of-hand. The "victim" is S. I. Parker. →

HEAD TABLE AT ANNUAL BANQUET, SATURDAY EVENING . . .

CALENDAR

PHILADELPHIA SECTION

Meeting: January 28, 1949 (Kugler's, Philadelphia.

SOUTHEASTERN SECTION

Meeting: December 4 (Atlanta, Ga.).

WESTERN NEW ENGLAND SECTION

Meetings: December 3, January 14, 1949, February 25, April 8, May 20.

NEW YORK SECTION

Meetings: January 28, 1949, March 4, April 1, May 6.

Outing: June 17.

COUNCIL

Meetings: January 28, March 25, 1949 (Hotel New Yorker, New York).

RESEARCH COMMITTEE

Meetings: January 28, March 25, 1949 (Hotel New Yorker, New York).

ONE HUNDRED AND SIXTY-FOURTH COUNCIL MEETING

THE Council held its 164th meeting in the Sheraton Bon Air Hotel, Augusta, Ga., on Thursday morning, October 21, 1948. Present were President Henry F. Herrmann, presiding; John N. Dalton and C. N. Rabold, Vice-Presidents; William R. Moorhouse, Treasurer; J. Robert Bonnar, Chairman of the Research Committee; Carl Z. Draves, Louis A. Olney, Thomas R. Smith and P. J. Wood, Past Presidents; David X. Klein, Ernest R. Kaswell and C. Wendall Lever representing Northern New England; J. Edward Lynn representing Western New England; Raymond W. Jacoby, Alden D. Nute and George H. Wood representing Rhode Island; Charles W. Dorn and William A. Holst representing New York; Walter F. Fancourt 3rd, Thomas H. Hart, Ernest E. Rettberg, Jr., Fred V. Traut and Jackson A. Woodruff representing Philadelphia; Leland G. Atkins and Wyss L. Barker representing Piedmont; Jack Anderson representing South Central; Robert W. Philip representing Southeast; Samuel Klein representing Mid-West; Albert E. Herrmann, Jr. and Jack Epelberg representing the Hudson-Mohawk Section, in process of organization; Kenneth H. Barnard, Chairman of the Convention Committee; Miles A. Dahlen, Chairman of the Technical Program Committee; Patrick J. Kennedy, Chairman of the Intersectional Contest Committee; Leonard S. Little, Chairman of the President's Asvisory Committee; Paul J. Luck, Chairman of the Publicity Committee; Robert R. Farwell, Herman E. Hager, Edward W. Lawrence; and Harold C. Chapin, Secretary.

The Secretary's report of the 163rd Council meeting and financial report of October 16, and the Treasurer's report of July 31, were accepted.

Referring to his recent report at the September Council meeting, Mr. Bonnar further reported for the Research Committee that a committee on test standards nomenclature and classification had been appointed.

P. J. Wood reported for Professor Lindsay's committee on student awards.

For the Publications Committee Dr. Olney reported on the Analytical Methods monograph now ready for publication, and on the Vat Dyeing monograph about to be compiled; also on the 1947-8 Year Book, and plans for the book of 1949. A proposed contract from the Society of Dyers and Colourists on the new *Colour Index*, was presented.

The Secretary was instructed to thank the citizens of Augusta for the cordial reception accorded the convention train of the Southern Railway System from the North.

Council meetings were called for January 28 and March 25, 1949, in New York; the second of these to be in the week of the Textile Wet Processing Exhibition, but without connection of any sort with this.

Mr. Rabold reported for the Committee on Membership and Local Sections, urging more sustaining memberships as an aid to research. The name and boundaries of the new Section in the Hudson and Mohawk river valleys were briefly discussed, and decisions left to this committee, augmented by representatives of this and adjoining Sections.

Elected to Corporate membership were Mandeville Mills, Inc. and Pepperell Manufacturing Co. Each of the following was elected to the class of membership specified, as of thirty days from publication of application, provided no objection be received meanwhile by the Secretary.

Senior

S. C. Accardo	O. T. Lankford
F. L. Anderson	R. S. Mayston
C. R. Barton	J. T. McGuire
R. C. Bogle	F. H. Myers
R. A. Corio	T. F. O'Malley
M. Czajkowski	J. C. Ostle
J. D. D'Alexander	J. M. Panetti, Jr.
C. N. Dufvenius	C. H. Ross
J. Flaks	J. B. Shohan
A. W. Goetz	R. R. Smith
W. G. Green	I. W. Spiegel
J. G. Hansen	O. S. Sprout, Jr.
J. C. Harvey	R. Taylor
R. G. Kelso	W. L. Thornburg
T. W. Kitchen	P. G. Tiemstra
R. V. Kuttruff	J. F. VandenBergh
A. W. LaCouture	G. E. Wright
J. H. Langston	W. C. Wurth

Associate

C. E. Anderson	E. Duarte
H. Chiang	M. W. Goodell
J. H. Clewell, Jr.	W. E. Hooke

SECRETARY'S FINANCIAL REPORT—OCTOBER 16, 1948

	Applications	*Dues, regular & reinstate*	*Corporate & Sustaining*	*Miscellaneous*	*Totals*
Received					
Aug. 1 to Sept. 21, 1948	$481.00	$ 101.50	$400.00	$2,364.15	$3,346.65
Sept. 21 to Oct. 16, 1948	413.00	3,856.50	270.00	1,779.95*	6,319.45
Total in fiscal year to date	894.00	3,958.00	670.00	4,144.10	9,666.10
Transmitted to Treasurer					3,346.65
Leaving with Secretary from the above					6,319.45
Leaving with Secretary, Treasurer's deposit for payment of bills					9,343.37

* Miscellaneous items

Dividends and interest	$ 405.50
Royalties, Launderometer	245.00
Royalties, multifiber cloth	121.35
Royalties, Rain Tester	36.59
Reporters	4.20
Year Books	250.50
Crockmeter	164.00
Crock cloth	93.75
Moth cloth	68.75
Water test apparatus	65.50
Dyed standards	20.30
Gas fading units	134.56
Buttons	4.00
Color transfer charts	14.00
Analytical Methods	2.00
Colour Index	150.00
	1,780.00
Less bank charges	.05
	$1,779.95

C. E. Irion — E. S. Minon
E. H. Keller — H. E. Mongovan, Jr.
S. F. Kowal — A. Nones, Jr.
P. C. Lindley, Jr. — A. A. Pavlic
J. T. Walwood

Junior

M. N. Bhagwati — H. A. Facilla
V. J. Christopher — R. L. Goldemberg
J. L. Claiborne — R. A. Strickland
R. E. Cote — W. V. Walukewicz

Student

P. Brassard — N. Lakshminarayanaiah
C. M. Clay, Jr. — S. C. Profio
W. F. Welcome

Transferred from other classifications to Senior Membership were:

R. E. Brown — J. M. Moran
P. D. Caine — E. J. Page
O. S. Oliver, Jr.

Respectfully submitted,
H. C. CHAPIN,
Secretary

Membership Applications

JUNIOR

Victor J. Christopher—Research Chemist, Mohawk Carpet Mills, Inc., Amsterdam, N. Y. Sponsors: J. J. Hanlon, E. J. Cogovan.

Jefferson L. Claiborne—Lab. Technician, Dixie Mercerizing Co., Chattanooga 1, Tenn. Sponsors: C. A. Spratt, J. W. Dooley.

Robert E. Cote—Lab. Asst., Woonsocket Color & Chemical Co., Woonsocket, R. I. Sponsors: R. T. McDowell, E. A. Richards.

Herman A. Facilla—Textile Dyer, General Dyestuff Corp., New York City, N. Y. Sponsors: H. E. Hager, T. J. Walsh.

Robert L. Goldemberg—Chemical Engineer, United Piece Dye Works, Lodi, N. J. Sponsors: R. J. DeWitte, M. Goldemberg.

Robert A. Strickland—Lab. Asst., American Woolen Co., Lawrence, Mass. Sponsors: A. Morrison, H. D. Grimes.

Walter V. Walukewicz—Lab. Technician, Ciba Co., New York, N. Y. Sponsors: M. G. Stern, H. C. Mullner.

ASSOCIATE

Charles E. Anderson—Sales., Textile Bag & Specialties Co., Chester, Pa.

Han-lo Chiang—Chairman, Cheng Yih Industrial Co., Ltd., Shanghai, China.

John H. Clewell, Jr.—Consultant, E. I. du pont de Nemours & Co., Inc., Arlington, N. J.

Eduardo Duarte—Technical Sales., Ahlers Lindley, Ltd., Lisbon, Portugal.

Merritt W. Goodell—Research Chemist, E. I. du Pont de Nemours & Co., Inc., Deepwater, N. J.

William E. Hooke—Tech. Sales., The Sherwin-Williams Co., Cleveland, Ohio.

Clarence E. Irion—Chief Chemist, Ben Mont Papers, Inc., Bennington, Vt.

Edwin H. Keller—Research Chem. Engr., E. I. du Pont de Nemours & Co., Inc., Wilmington, Dal.

Stephen F. Kowal—Chemist, Burlington Mills Corp., Greensboro, N. C.

Paul C. Lindley, Jr.—Asst. Purch. Agt., Burlington Mills Corp., Greensboro, N. C.

Emilio S. Minon—Gen. Mgr., La Hortensia, S.A., Zumpango, Mexico.

Harold E. Mongovan, Jr.—Salesman, Calco Chemical Div., American Cyanamid Co., Bound Brook, N. J.

Adolfo Nones, Jr.—Chem. Engr., Textron Puerto Rico, Ponce, Puerto Rico.

Albert A. Pavlic—Chemist, E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

John T. Walwood—Lab. Asst., American Woolen Co., Lawrence, Mass.

STUDENTS

Paul-Yvon Brassard—St. Hyacinthe Textile School. Sponsor: G. R. Boule.

Cassius M. Clay, Jr.—Massachusetts Inst. of Technology. Sponsor: E. R. Schwarz.

N. Lakshminarayanaiah—Lowell Textile Institute. Sponsor: E. E. Fickett.

Samuel C. Profio—Lowell Textile Institute. Sponsor: E. E. Fickett.

William F. Welcome—Lowell Textile Institute. Sponsor: E. E. Fickett.

APPLICATIONS FOR TRANSFER TO SENIOR MEMBERSHIP:

Ruth E. Brown, Philip D. Caine, Juliette M. Morgan, Edgar J. Page, Owen O. Scott, Jr.

Recent Visitor to AATCC Headquarters

DR. SAMUEL MEYERS of the Harvard Graduate School, Department of Economics, visited AATCC headquarters to discuss appraisal of laboratory testing methods as a basis of predicting quality and performance of consumer goods. A comprehensive study and survey is being made in the over-all field of Product Labeling under Prof. Black, expert on marketing. Dr. Meyers is at present working on the phase specifically referring to textiles.

Report, North Carolina State College Student Chapter

AT a meeting on October 14, 1948, Marshall B. Corl was elected Chairman; Joe R. Stillwell, Secretary; and Ralph Murray, Treasurer. Professor H. A. Rutherford, Head of the Chemistry and Dyeing Department, discussed the advantages of membership.

Respectfully submitted,
JOE R. STILLWELL,
Secretary

Report, Bradford Durfee Technical Institute Student Chapter

ON Sept. 28, 1948, a program committee was appointed, consisting of Edward Kelly, Leonard Connors and David Sanders. Mr. Dubiel was thanked for making posters. W. H. Wingate spoke on the advantages of membership.

On October 7, Alan Corry, Superintendent and Dyer, Colonial Processing Co., Pawtucket, R. I., spoke on "Practical Methods for Dyeing Cotton and Rayon." Forty-two members and guests were present.

Respectfully submitted,
MIRIAM MURPHY
Secretary, pro tem.

All correspondence regarding the EMPLOYMENT REGISTER should be addressed to the National Secretary

EMPLOYMENT REGISTER

This column is open for four insertions per year, per member, without charge. Blanks can be obtained from, and filed with, the Secretary of the Association, Lowell Textile Institute, Lowell, Mass. It is understood that these will be open to inspection by prospective employers, who can obtain further information from the Secretary.

48-13

Education: PhD, physical chemistry.

Experience: Research chemist and laboratory director; synthesis of finishing materials and detergents; several publications.

Age 38; married.

11-1, 11-15, 11-29, 12-13

ONE HUNDRED AND FIFTY-FIFTH GENERAL RESEARCH COMMITTEE MEETING

THE 155th meeting of the General Research Committee was held at the Hotel New Yorker in New York, Friday, September 24, 1948. Chairman J. Robert Bonnar presided.

Executive Committee on Research

Reporting on the activities of the Executive Committee of Research, Mr. Bonnar stated that there is gratifying activity on the part of the Sectional Advisory Research Committees. He referred specifically to a project to be started which it is hoped will result in lengthening the life of stainless steel equipment in the field of dyeing. It will enlist the assistance of machinery manufacturers, and Sectional Advisory Research Committees will collect data on local experience with this type of equipment. There also will be a study made, which it is hoped will standardize the gradings of fastness tests, leading to official terminology for expressing results of fastness tests. He placed emphasis on the importance of end use tests and referred specifically to the activities of the wash fastness committees and the Consumer Survey previously reported to determine acceptability of colored garments in end use. Referring to the Crockmeter he explained the alterations and refinements which have been proposed in connection with the use of this instrument and stated that this committee will be reactivated for further work. After a short resume of the situation on several other committees he requested Dr. Stiegler to report on progress at Lowell.

Report of Director of Research

Dr. Stiegler reviewed the situation at the Lowell Laboratories, stating that new equipment has arrived for setting up a laboratory in one of the AATCC rooms. He also reported that they had had a visit by a young woman who is in charge of the Home Economics Division of the American Washers and Ironers Association. The Quartermaster Corps project, as previously reported, has been finished and a written report submitted to the Quartermaster Corps. It is our understanding that this report is being studied and will be publicized by the Quartermaster about the end of this year. The work on the Chemical Warfare project has been completed and a written report drawn up. In connection with the work on dimensional change Dr. Stiegler reported that a tension dryer is now being investigated, a new incumbent of the fellowship has started, and that work is progressing on the development of a smaller instrument of evaluation. Water repellency work is continuing and is now including a study of this feature on wool. The use of the rain tester in evaluating water repellency on wool is being studied.

The salt project has been completed. The theoretical work done at Lehigh University has resulted in a written report. Practical application in mill work and practical laboratory evaluation were carried out at Lawrence, Massachusetts and have arrived at the same conclusion indicated in the theoretical work. The main conclusion may be stated simply, that in the dyeing process sodium chloride and sodium sulfate are interchangeable. One mill which has been operating on sodium sulfate is planning a three to four month practical run on the use of common salt in place of sodium sulfate in order to confirm the indicated results of all previous work. Dr. Stiegler mentioned the work done by the Lowell group in the preparation of exhibits for the Augusta meeting.

Wash Fastness

Charles W. Dorn, reporting for the Wash Fastness Committee referred to our recent experience with the Launderometer test compared with commercial laundering, stating that when originally set up one AATCC #3 Test was considered the equivalent to five commercial launderings. This appeared to be a very satisfactory accelerated test. Since that time, however, conditions have changed considerably leading to much confusion in testing programs, as well as loss of time. Since many commercial laundries have increased the size of their loads to as much as four times what was understood to be regular practice, the resulting increase in friction has been further accentuated by some decrease in the amount of soap, which acts as a lubricant in washing. Apparently some of the home laundering machines are also more active in removing color than was the case originally. Mr. Dorn made reference to the consumer survey which is to be conducted under the auspices of the American Standards Association committee and expressed the belief that the results of this survey will furnish a definite basis for a more modern approach to wash fastness testing. It is the opinion of this committee that a washing formula should be devised which adequately removes soil. It should then be set up as a standard procedure, which the laundering industry should be expected to adopt. This would permit a revision of the AATCC wash tests to put them into the same advantageous position they originally occupied. Mr. Dorn referred to the continuation of the work at Lowell evaluating various containers and other alterations which would increase abrasion in the test. It is hoped that a minimum alteration in the present Launderometers will suffice to give suitable tests such that we can return to one Launderometer test being equivalent to five commercial launderings, and that the test be one which can be run in three-quarters of an hour. He also referred to comparative work on a greatly accelerated test, one which would give perhaps as much abrasion in five minutes as 30 commercial launderings.

Light Fastness

W. A. Holst, Chairman of the Committee on Light Fastness reported on the progress of the Fadeometer calibrating program with particular reference to the papers developed at the National Bureau of Standards. While it was expected that these standards would be available for distribution to the various testing laboratories by this time, the work is still in progress. It is expected that they will shortly become available. Further work has been done by this committee with the General Electric Company on the integrating radiation meter. Tests are continuing but no final report is available at this time.

Durable Finishes

Kenneth Barnard reporting for the

Committee on Durable Finishes referred to two new instruments for measuring the angle of recovery of treated fabrics. The Monsanto Tester of which over 100 are in use has advantages over the classical TBL method in that it measures the angle of recovery more accurately than is possible by determining chord length. There is less handling of the sample and it is hung vertically to eliminate the effect of gravity. It has the further advantage of being simple and cheap since it is available at $15. American Cyanamid sponsors a motor driven roller pressure method in which the angle is measured by its contour shadow on a lighted screen. Great accuracy is claimed; various factors influencing the measurements have been studied and reported in the August 9, 1948 issue of the *American Dyestuff Reporter*. It is estimated that this machine can be made for about $150 and that a modification would permit running several samples at one time. It is the opinion of the committee that both of these instruments are superior to the TBL method and that they should be checked against each other. A program is now planned with the expectation that the work can be completed before next June because of the urgent need for satisfactory standards of performance of crease resistant finishes.

Dimensional Changes

Dr. William E. Coughlin, Chairman of the Committee on Dimensional Changes in Textiles reported that the work of the sub-committees has been confined entirely to studies on wool products. The wool sock program has proceeded to the point that the sub-committee is nearly ready to report on a tentative method for measuring shrinkage. The Boston sub-committee has already submitted a tentative method for determining shrinkage in wool fabrics. This tentative method is now undergoing critical review in various places. The factors which the committee feels require further study, so far as our present tentative standard method is concerned, are the following:

Soap—A study should be made of the proper concentration of soap in this test.

The wetting out of the samples prior to measuring relaxation shrinkage should be studied.

An accelerated method should be devised which would predict the behavior of fabrics in perhaps ten commercial launderings rather than three or four, which is generally expected to be the case with the present tentative method. This acceleration may be acquired by use of higher temperature or higher speed.

The tentative test which has been presented was passed by the Research Committee as a tentative standard. The committee is not yet in a position to report on the knit goods phase of their program.

Water Resistance

In the absence of A. McNulty, Acting Chairman of the Committee on Water Resistance of Fabrics, Dr. Stiegler read a report submitted by this committee. The recommendation was made that the General Research Committee act upon the proposal that the procedure now published in the *Year Book* as a tentative standard be accepted as an official AATCC Standard Testing method, and that the following modification be similarly approved:

1. The apparatus may be adapted for a one foot head.
2. Water penetration, as indicated by the increase in weight of the blotter be not restricted to a five minute exposure during the test period, and that the sentence in the last paragraph on page 149 of the Year Book under "Evaluation" be eliminated. This sentence now reads "Penetration of over 10 grams are recorded as 10 plus grams."

The committee further recommends that the AATCC at Lowell determine which manufacturers are able to supply blotting paper to meet the requirements of this test and arrange to have paper manufactured, stored and supplied to users. The General Research Committee formally approved this recommendation.

The committee further recommended to the Executive Committee on Research that a joint committee be appointed to establish a standard test procedure for washing and dry cleaning water resistant fabrics to test the durability of the finish. It was also the opinion of the committee that water filters used in conjunction with installations of the rain tester should not be restricted to those manufactured by the Filtrene Company but that other approved filters may be recommended when inquiries are received.

Perspiration

C. H. A. Schmitt reported for the Committee on Perspiration. This committee has examined the latest model of the Perspirometer which is expected to be adopted as part of the new testing method. This simple device uses the plate method for carrying out the tests but has the advantage of measuring accurately the proper pressure on the plates and materials under test. The committee is proceeding to rewrite the specification and expects to submit the complete testing method for approval as a tentative method at the meeting in Augusta.

Fire Resistance

In the absence of the chairman of the Committee on Fire Resistance, Dr. Stiegler reported that no conclusion has yet been reached and that the committee is working on the matter of char length on light fabrics. Dr. H. E. Hager, Chairman of the Sub-Committee on the Flammability of Consumer Textiles stated that his group have completed their tests and are now working on tabulation with the expectation of presenting their conclusions at the meeting in Augusta.

Ageing

J. D. Dean, reporting for the Committeen on Ageing of Textiles summarized the progress which has been made to date. This committee is studying degradation caused in textiles by weathering or by storage under adverse conditions with a view to the production of relatively short term testing procedures which will predict textile performance. Storage tests are in process. A number of weather exposures under different conditions are also proceeding together with accelerated weathering tests so that considerable data are building up. Due to the fact that preliminary results indicate that there is considerable variation in the resistance displayed by individual fibers to different kinds of light, this committee will continue to gather data prior to an attempt to arrive at conclusions.

Snag Resistance

In the absence of the chairman of the Committee on Snag Resistance, Dr. Stiegler read their report. The committee is engaged in an inter-laboratory program to evaluate the sandpaper type tester, which is expected to be completed and reported next month. Further plans will await the results of this program.

Analysis of Fiber Mixtures

J. D. Dean, reporting for the Committee on the Analysis of Fiber Mixtures stated that the work is progressing, is in the nature of comparative trials of alternative methods and it is expected that at least six month's further work will be involved.

Retention of Chlorine

In the absence of the Chairman of the Committee on Retention of Chlorine, Dr. Stiegler reported that the work is still in

(Concluded on Page P784)

ONE HUNDRED AND FIFTY-SIXTH

GENERAL RESEARCH COMMITTEE MEETING

THE 156th meeting of the General Research Committee was held in the Crystal Room of the Hotel Sheraton Bon Air, Augusta, Georgia, Friday, October 22, 1948. Chairman J. Robert Bonnar presided.

This meeting, an important function of the Annual Convention, was attended by the membership of the Association, and was held in conjunction with a dinner. Following the dinner Mr. Bonnar introduced those at the head table who are or have been members of the Executive Committee of Research, and those present who are chairmen of sectional advisory research committees. He then introduced Dr. J. H. Dillon, Research Director of the Textile Research Institute, who explained the fundamental dyeing program now under way as part of the activities at the Textile Research Institute, Princeton, New Jersey. He explained the nature of the support of this program by the rayon companies, the fact that it has been underwritten for a five-year period and welcomed the cooperation offered by the AATCC. Mr. Bonnar then introduced Dr. T. Vickerstaff of Imperial Chemical Industries who is visiting this country and attended the convention. He talked of the activities of the Society of Dyers and Colorists, pointing out that while their organization is smaller so far as the number of members is concerned, they are very proud of their accomplishments. He described their activities, which are similar to those of the AATCC, and stressed the fact that its membership is made up of those interested in the academic aspect and those connected with dye makers and dye users. He described the work of one of their committees on which he served, which investigated the behavior of direct colors on cotton, and pointed out that the work of this committee is nearly finished. He referred to other similar committees studying the behavior of direct colors on rayon, of acid colors on wool, a committee which concerns itself with the classification of vat colors, and the *Colour Index* Revision Committee. He stressed that their program constitutes an educational program for practical dyers and mentioned their symposia, such as the one held during the summer at Blackpool, their summer school, and the value of their sectional meetings.

Mr. Bonnar responding expressed the opinion that while our association had not held symposia, he believed we may adopt the idea and in the not too distant future. Mr. Bonnar then made mention of a new committee on nomenclature and classification, which is under the chairmanship of Dr. Draves; referred to the study of available pilot plant equipment which is now in progress, and advised that the research budget for the coming year is $48,500 in spite of some publicity given to other figures. He then referred to the elements of confusion inherent in a situation where so many different tests are recognized as official by different groups pointing out that in CS-59-44, CCT-19A, AATCC and ASTM we have in this country various types of standard tests. By a process of investigation and cooperation it is hoped that universal acceptance of one test by these various groups may be accomplished. This would have important advantages and later might even extend to agreement internationally on tests. He then made reference to the fact that a situation which has cropped up in connection with fastness tests for the *Colour Index* has made it necessary to eliminate red tape and set certain tests up as interim tests. Our official set-up calls only for standard or tentative tests, whereas he is suggesting, at least temporarily, the establishment of interim tests in order to enable the *Colour Index* Committee to proceed with its work. While no vote was taken there were no unfavorable comments from the group.

Program at Lowell

Mr. Bonnar then introduced Dr. Stiegler who described the program at Lowell. He pointed out that while most of the work at the present time is devoted to developing test methods the scope of our research contemplates also work in the field of wet processing. It is hoped that as we go along this latter work will be able to get additional emphasis. He brought out the fact that the committee heads were not only responsible for the work of their committees but for additional responsibilities in connection with the work at Lowell. Dr. Stiegler then gave a fairly detailed report of the work which has been done and completed on the O. D. 7 shade for the Quartermaster. He referred to the 15 or 20,000 yards of cloth which had been dyed in the mill using 14 different methods of prepare, and then dyeing by the pad-jig method on these 14 different cloths. Based on the results of this work the best methods of prepare were dyed using four different formulas by four different methods including pad - jig, pad - steam, Williams unit and continuous booster. These items were then evaluated for fastness and the whole program had been planned by a steering committee of experts. It is expected that the report will be released for publication in the *American Dyestuff Reporter* early next year and the general statement can now be made that the results of the work justify the opinions of the experts. He then referred to the confidential Chemical Warfare Project and to the fact that the report has been completed and submitted. He explained the work on the dimensional change in restorability done under the American Viscose fellowship, the fact that an instrument has been developed and that further work is going on to develop a smaller instrument. He then referred to the water repellent work which has been published to some extent, explaining that 14 different methods of evaluation had been compared. This program will be completed if and when a rain room is again available. This committee will also work on the problem of evaluating water repellency on wool. He referred to the great amount of work at Lowell on abrasion factors in testing for wash fastness and the problems in laundries due to use of lower volumes and lower soap ratios. The work at Lehigh and at Lawrence on the comparison of sodium chloride and sodium sulfate in the dyeing of wool was reported as having been completed and thus far indications are that these two agents are interchangeable. He referred to the work at Lowell in preparing the exhibits which were set up during the Convention, with especial mention of the detergency committee.

Dimensional Changes

Mr. Bonnar in accepting Dr. Stiegler's report referred to the fact that the activity at Lowell centralizes much of the actual work done in connection with our research committee on Dimensional Changes in Textiles. This report was essentially the same as that given at the September meeting of the Research Committee, pointing out the additional details that the Sub-Committee on the Evaluation of Shrinkage-Controlled Wool Socks, in cooperation with the National Association of Hosiery Manufacturers, is distributing hosiery to various companies who will apply their shrinkage resistant treatments to the socks. The treated socks will then be evaluated in several laboratories by means of the Schiefer machine, after the following treatments:

#1 Ten consecutive Army wool launderings, including dry tumbling.
#2 Home laundering—Bendix and G. E. Spinner type.
#3 Wear tests—20 to 25 individuals with hand laundering.
#4 Laboratory accelerated tests—Army Quartermaster 140° F.—5-lb. load.

For the Sub-Committee on Dimensional Changes in Woven Woolen Fabrics, previously identified as the Boston Committee, he referred to the work done by this committee in relating a Pacific Mills accelerated wash test with commercial laundry practice, home machine washing, wet cleaning and the CC-T-191A test. Seven laboratories participated: Arlington Mills, American Woolen Company, The Derby Company, American Institute of Laundering, Pacific Mills, New England Testing Laboratory, and the National Institute of Cleaning and Dyeing. These tests indicated that the Pacific Mills accelerated tests were equivalent to approximately three or four standard commercial wool launderings and this method with minor changes has been submitted to and accepted by the AATCC as a tentative method. Improvements on this method are now being studied by the Boston Section and involves the following points:

1. The use of water alone instead of soap and water for laundering in the test procedure.
2. Checking the advisability of adopting several successive short launderings and pressings instead of one long laundering followed by pressing.
3. The effect of drying the samples after relaxation in an oven versus drying the samples by pressing.
4. Determining the effect of 10 or 20 commercial launderings, whichever gives a maximum of shrinkage in a given sample and determining the acceleration of the test method which gives an effect corresponding to this maximum shrinkage.
5. The advisability of incorporating wetting agents in the relaxation soaking bath.

This committee has not made a study of dimensional changes in knitted fabrics nor on rayon fabrics.

Light Fastness

Mr. Bonnar then introduced W. A. Holst, Chairman of the Committee on Fastness to Light. He referred to the new lot of dyed paper for use in calibrating Fadeometer exposures and stated that it is expected shipments of the new paper and faded standards will be made to those requesting them in the very near future. He also referred to the work with the General Electric Company on the modification of their Totalux device for measuring fading intensity. One unit has been undergoing test at the Bureau of Standards, and one unit will undergo intensive tests by Atlas Electric. The developments in this direction will be followed by the committee.

Wash Fastness

At this point Mr. Bonnar commented on the difference between this public meeting held rather late in the evening, and the procedure at the usual stated meetings, explaining that this meeting was moving much faster because there was less discussion of the reports. He then introduced Mr. Seibert who reported on the activities of the Committee on Fastness to Washing. Mr. Seibert referred to the history of this committee pointing out that they had developed their first method of evaluating wash fastness in 1922, and subsequent developments led to the introduction of the Launderometer in 1929, and a test which at that time was equivalent to five or more commercial launderings. In 1939, because of the introduction of pigment dyed fabrics, the test was revised. He then explained the changes in commercial laundering practices which have interfered with the effective use of the Launderometer test on the basis originally set up. He described in detail the many individual tests necessary to resolve the difficulties of testing fastness to washing on cotton. He advised that sub-committees on linen, synthetic fibers, hosiery and woolens have been at work and pointed out that considerably more work is necessary before reports can be made available. He then referred to the consumer survey to be undertaken by the American Standards Association Committee and left no doubt in the minds of his hearers that this committee recognizes a distinct responsibility in bringing this whole matter to a fairly early conclusion.

Insect Pests

In acknowledging this report Mr. Bonnar stated that it appeared to him that this subject, when it is completed, would serve as a central theme for a symposium which could be conducted by AATCC. He then introduced H. E. Wilde, who reported for the Committee on Resistance to Insect Pests. Mr. Wilde thanked the many participants in the work of this committee, referred to the difficulties of the early work and the fact that although a great deal of the data was collected, correlation proed to be impossible. In March, 1947, it was agreed by the four interested organizations, that is, AATCC, ASTM, NAIDM and NRDGA to disregard all previous data and findings and start from scratch. At a meeting, tentative test methods were set up subject to review after completing tests on two fabrics. Mr. Wilde described some of the difficulties which attended the work even after the fresh start was made and the method of resolving this difficulty. Webbing clothes moths and black carpet beetles were the insects used in this work. Seven fabrics were studied by three laboratories and the data have been summarized and graphed. It is expected that at the next meeting of the Research Committee a complete report and recommendation will be submitted.

Perspiration

Mr. Bonnar then introduced J. N. Dalton, who reported for the Committee on the Fastness of Dyed Material to Perspiration. This committee found the old perspiration test not entirely satisfactory. Three years ago work commenced by reactivating the committee to investigate the character of the test solution and the applicability of the test method. After much work a new proposed tentative test method has been evolved which will shortly be presented to the Research Committee for acceptance. The committee has emphasized the following factors:

Flexibility — a simpler technique and involving only 6 hours time instead of 18 hours.
Reproducibility — by using a measured 10-lb.-pressure on the fabric.
Simulation of actual service conditions.
Economy of running the method.

While the plate tester must be purchased it is not expensive and there is a decrease in the labor cost. The instrument involved has been termed the Perspirometer and the

solutions as presently set up in the standard method are considered adequate.

Fire Resistance

Mr. Bonnar then introduced Dr. H. E. Hager who presented the report for the Flammability Sub-Committee of the Fire Resistance Committee. Dr. Hager reported that following considerable objection to the proposed commercial standard, the committee had appointed an advisory committee of 17 members, which included most of our AATCC committee members. Tests were conducted in seven laboratories on our inclined tester on 33 cotton fabrics. Correlation of results was difficult on any pile or tufted fabrics like chenilles. The instruments were rechecked by the manufacturers and some alterations in procedure were worked out. A new study of 20 fabrics, most of them napped cottons and chenilles, included work not only on our machine but also on the horizontal Bureau of Standards tester and some work on a smaller vertical machine developed by the Fire Marshall of California. The results of these tests will be published in an early issue of the *American Dyestuff Reporter*. General conclusions are:

1. A precise determination of flammability is not possible by any of the testing methods.
2. The inclined AATCC tester is definitely preferable to the horizontal tester and there is not sufficient evidence that the California machine performs better than our AATCC tester.
3. None of the machines measured flammability with sufficient accuracy to enable municipal, state or federal laws to be adequately established.

It is expected that some further work will be done leading to a third testing program following which it is hoped that we will be in a position to set up a new commercial standard which will be acceptable to industry.

Detergency

A written report was also submitted by C. L. Nutting, Chairman of the Wool Detergency Committee. This report was not read at the meeting. The initial objective of this committee from its inception has been the development of a laboratory machine for evaluating detergents for cleaning wool. A description is given of the first crude model of such a machine and the work which led to the development of an improved apparatus. Riggs & Lombard Company produced a second model of a laboratory detergency comparator which was exhibited at the Annual Meeting in New York in 1945. Further tests on this machine demonstrated weakness in design and changes have been made from time to time. Much testing preceded and followed each change. Lately Riggs & Lombard have designed and constructed a third model which was exhibited at this Convention. Further evaluation tests will be necessary before the committee is satisfied that it now has the proper device. When the committee is satisfied it will so report and it is their present belief that this comparator may have other uses where the mechanical action it provides is desirable, and that suitable arrangements can be made for making it available generally to the industry.

Upon completion of the program Mr. Bonnar expressed the thanks of the Association to the chairmen and committee members of the active research committees, and also expressed the appreciation of the Research Committee to the members and hoped that this opportunity which had been given them to sample a regular meeting of the General Research Committee had been of interest to the members generally.

—♦ ♦—

155th Research Meeting

(Concluded from Page 781)

progress and it is hoped that a formal report will be available at the next meeting.

Resistance to Insect Pests

H. E. Wilde, Chairman of the Committee on Resistance to Insect Pests, states that the data resulting from the very extensive work done by this committee have been summarized and put in graph form and are now being studied. It is expected that conclusions will not be available by next month's meeting.

Classification of Tests

Dr. C. Z. Draves pointed out that in the *Year Book* classification of color tests does not appear to be uniform, and stated that the use of a uniform system of numbers for expressing fastness tests should be investigated. After some discussion the principle involved was formally approved. A committee is to be appointed to report later and will also consider the question of uniform terminology to go with the new number system. Mr. Dorn expressed the hope that the uniform system of numbering and terminology could be drawn up so that a definite relation with end uses could be indicated.

Tests

Mr. Cady, referring to the tests to be included in the *Colour Index*, pointed out out that we in this country do not have the same tests that are used in England. It is planned to have a committee drafted from various sources to investigate tests to fill in blanks, and reconcile the differences between American and English testing practices.

Those present were:

J. R. Bonnar
W. D. Appel
K. H. Barnard
G. L. Baxter
E. C. Bertolet
W. H. Cady
H. C. Chapin
H. M. Chase
W. E. Coughlin
J. D. Dean
C. W. Dorn
C. Z. Draves
A. W. Etchells
H. E. Hager
H. C. Haller
S. L. Hayes
W. A. Holst
R. W. Jacoby
N. A. Johnson
A. J. Kellner
L. O. Koons
L. S. Little
P. J. Luck
J. E. Lynn
A. R. Macormac
O. F. Marks
J. E. Meili
H. Miller
A. D. Nute
L. A. Olney
R. E. Rupp
C. H. A. Schmitt
G. H. Schuler
H. A. Scruton
J. A. Stevenson
H. W. Stiegler
C. A. Sylvester
H. H. Taylor
P. Theel
F. R. Tripp
J. F. Warner
H. E. Wilde
G. H. Wood
P. J. Wood
H. L. Young

—♦ ♦—

December 3rd Meeting, WNE Section

A MEETING of the Western New England Section will be held on December 3rd at the Stoney Hill Inn, Danbury, Connecticut. Dr. R. B. Barnes of the American Optical Company will discuss "Optical Instruments in the Textile Industry."

This meeting is being arranged by a very active committee representing the hat makers in the area and indications are that it will be unusually attractive. A miniature hat making machine will be demonstrated and there will be a display of auxiliaries for hat making.

Dinner will be served at 7:00 P.M. preceded by the usual informal reception. Dinner reservations may be made with Robert N. Brownlee, U. S. Rubber Company, Naugatuck, Connecticut.

Western New England Section—

AUXILIARY PRODUCTS IN DYEING*

H. C. BORGHETTY
General Dyestuff Corp.

OUR subject this evening concerns one of the subdivisions of the group of auxiliary products. Although it is not actually possible to rigidly subdivide all such products into distinct groups, we can, for convenience of discussion, consider that there are three different families, namely;

(1) Products used in the desizing, scouring, degreasing and general preparation of fibers and fabrics, to render them readily receptive to dyes. To this group belong the soaps and synthetic detergents, the specialty wetting agents such as those stable in mercerizing baths for cotton or in carbonizing solutions for wool; many of the true wetting agents used in desizing, bleaching or kier boiling; also the rewetting agents when used in prepadding of greige cloth to obviate or supplement the preparation.

(2) Surface active agents used in dyeing to facilitate penetration and levelness, and to protect against the action of hard water, or to stabilize the dye fastness.

(3) The general finishing agents used to modify the physical characteristics of fibers and principally fabrics, and to impart variation in hand or improve wearability.

The three groups of products and uses have become of great importance in the last 15 to 20 years. Many of you undoubtedly are large users of all types, some may be are interested in a few only, while some of you still feel that you can get along well without them. Whatever the feeling, however, there is no doubt that the development and activity in this field has already surpassed that present in the actual dyestuff industry, which laid the ground work for the entire development of the surface active products. In view of the fact that our subdivision, 2, today represents selections of the main group, we must of necessity consider the chemical constitutions of the main group as a whole. The literature converning this chemistry is abundant, and in many cases it is quite easy to predict the behavior of a compound for certain specific uses merely by the formula. It is worth while emphasizing, nevertheless, that the decision of all new developments can be made only after actual plant trials have been carried out. Thus you as dyers, chemists, and finishers, are the final arbiters of all new products. Even the testing of these during research and development is still on an empirical basis. Standard emulsification, dispersion and level dyeing tests are of this order. Even the Ross-Miles foam testing procedure, and the well established Draves-Clarkson wetting test and the canvas disc method, are empirical. The former, by evaluating foam, a condition of surface activity (air-liquid interface) indicates potential use of a new product; and the latter, which actually measures a complex of the various interfaces involved, give reliable and sufficiently reproducible data on the general properties of a compound for textile use.

Compounds possessing detergent properties have also wetting and emulsifying powers, but the reverse is not true. When testing a dyeing assistant for wetting test alone, therefore, no complete data can be obtained. Wetting tests, because of their simplicity, are often used for evaluation of all surface active compounds, and often give misleading conclusions. Detergent properties in a dye bath can hinder the yield of dyeing, and it is for this reason that the new ethylene oxide condensates are becoming increasingly important.

The exact function of wetting agents in direct dyeing is to cause the fiber, particularly if poorly prepared, to become readily and completely saturated with the dyestuff solution, so that it has access to the inner fiber structure. Leveling agents, on the other hand, possess a retarding action on the dyestuff, either by solubilizing it further, or by holding the dyestuff aggregates in solution longer. Once a chemical compound is found to possess emulsification, dispersion, wetting and detergent properties, the constitution can be varied along certain well established lines to give the necessary improvements.

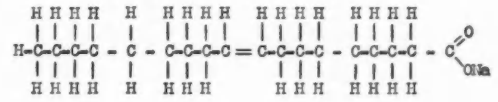
We do not need to sandwich into our talk an excessive amount of the chemistry of the many products studied and discarded in the development of those on the market at present. Many articles have appeared on the vast array of the synthetic detergents (group 1) and a great deal of literature is available on the finishing compounds (group 3) including the resins, mothproofing agents, water repellents, etc., but very little literature has appeared on those surface agents in dyeing.

Chemical Constitution

Surface active molecules possess the general characteristics of all surface active agents, and are composed of a hydrocarbon chain which is the hydrophobic, nonpolar portion, and a solubilizing polar grouping. The balance between these two opposites determines the behavior and solubility of the resultant agent.

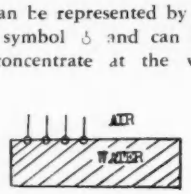
The hydrophobic or water-repelling portion is free to attach itself to other hydrophobic products, while the hydrophilic or water-friendly part will always tend to be attracted to water. The concentration at the surface of water, or the interface of water and oil, explains the wetting and emulsification properties of the final product. Soaps typify all the groups of surface active agents used as detergents; they possess a long hydrocarbon chain (C^{12}-C^{18} with one terminal—COONa—water soluble group. An example of the method of operating is that the non-polar chain attaches itself to oil and the total is floated away or emulsified in the water because of the polar group. The longer the fatty chain, the higher the detergency.

Typical of soaps used in the textile industry is sodium oleate. Its molecular structure is—



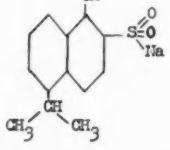
* Presented before meeting, Western New England Section, September 10, 1948.

and this can be represented by the polar: non-polar symbol ♁ and can be considered to concentrate at the water surface as:

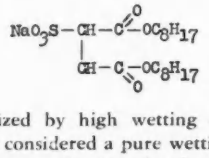


or orient at an interface of water-oil as:

All these products are colloidal electrolytes. Some are primarily wetting agents such as the alkyl naphthalene sodium sulfonates, di-isopropyl naphthalene sodium sulfonate:



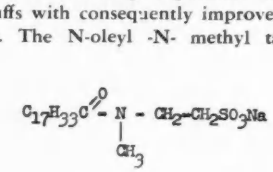
which has since been surpassed in wetting efficiency, but not in stability, by the di-octyl sodium sulfosuccinate:



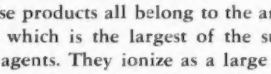
characterized by high wetting only and therefore considered a pure wetting agent, as is also the closely related tricarboxylic acid ester sulfonate. The first type of product is satisfactory for wool dye baths because of the stability, whereas the other two types are confined to wetting in neutral baths (pigment padding of vats, etc.) and, because of their wetting-back qualities, also in the preparation of greige cloth.

Modifications of the alkyl naphthene sulfouates, characterized by the same stability but greater wetting properties, are the alkyl aryl sulfonates derived from petroleum:

These are very versatile materials possessing detergent properties. They can be applied satisfactorily in boiling acid dye bath, and exhibit the wetting and penetrating properties desired on wool, besides possessing the —SO_3Na group required for retarding deposition of acid dyestuffs with consequently improved levelness. The N-oleyl -N- methyl tauride type:

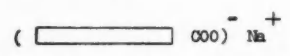


which is a true detergent type, though possessing some level dyeing properties on wool, cannot compare with the alkyl aryl type for leveling, because it does not have sufficient similarity in behavior to the acid dyestuffs themselves. The same considerations are true for the sodium lauryl alcohol sulfate:

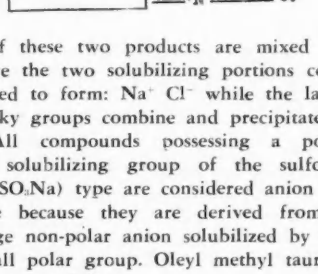


and the other sulfonic types.

These products all belong to the anionic group which is the largest of the surface active agents. They ionize as a large negative ion (or anion) and a small positive ion (or cation) in like manner to soap (sodium oleate):



Cationic compounds of reverse charge ionize with the larger portion in the cation such as in cetyl pyridinium chloride:



If these two products are mixed we have the two solubilizing portions combined to form: Na^+ Cl^- while the large bulky groups combine and precipitate.

All compounds possessing a polar or solubilizing group of the sulfonic (—SO_3Na) type are considered anion active because they are derived from a large non-polar anion solubilized by the small polar group. Oleyl methyl tauride ionizes as follows:

$(C_{17}H_{33}$ ——CO . NH $CH_3.C_2H_4SO_3^-)Na^+$

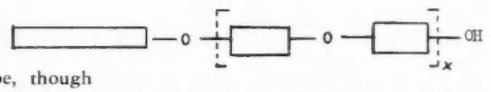
very large anion (⁻) *small cation (⁺)*

Quaternary ammonium compounds containing nitrogen in so-called pentavalent form instead yield *cationic* compounds.

Non-polar organic compounds are made water soluble by adding polar groups to give either the anionic active compounds or the cationic types. Molecules so derived are really heteropolar because they are no longer one or the other, but contain both polar and non-polar portions in a balance.

The group of auxiliary compounds known as non-ionic are compounds which do not ionize in solution and are soluble in the same manner as for instance, alcohol.

Not possessing any positive or negative ions, they are miscible with either anion active compounds or cation active compounds. An example is the polyethylene ether of lauryl alcohol:



Classification of Auxiliary Products in Dyeing

The sulfonic R-SO_3Na and the sulfate R — O — So_3Na are classified, particularly in wool dyeing, as:

Auxiliary Products Possessing Affinity for the Fiber, while the ethylene oxide condensates R — $(CH_2CH_2O)_xOH$ are known as:

Auxiliary Products Possessing Affinity for the Dyestuff.

Herein lies the fundamental difference between the level dyeing properties of the two groups. In the anionic sulfonic type the effect is obtained, (apart from the true wetting) through a retardation caused by the surface active agent competing with the dye molecules for position on the wool amino groupings, then yielding place over a prolonged dyeing period.

Those compounds possessing dyestuff affinity, on the other hand, hold the dye in the bath temporarily, thus leveling.

They perform the same function in direct, vat, sulfur and acetate dyeing.

In vat dyeing the nonionics are particularly useful because of the absence of salting action; and it is for this reason mainly that they are displacing the sulfonic types. They furthermore are made in neutral form, contain no salt as diluents, and are produced economically from synthetic raw materials. Modifications can be made to yield detergent and wetting types.

Besides the use of surface active agents in dyeing proper, there are many considerations which arise constantly on account of present day trends towards streamlined production accomplished by the introduction of continuous machines. We thus contend with traces of the wetting agents or detergents used in desizing, bleaching or boil-off affecting the properties of dyeing by interfering with the agents employed. Non-ionics causing retardation by forming dyestuff aggregates are rendered less effective or valueless by the presence of anionics. Quaternary compounds used in boil-off can cause spotting of dyes, excepting basic colors. Sometimes

no apparent precipitate is formed because the excess of either anionic or cationic is an emulsifying agent for the complex of the two.

Newer types of cationic are however, being developed, possessing solubilizing groups in addition to the polar group. They have been employed with success in the dyeing of tippy wool.

Agents Used for Simultaneous Scouring and Dyeing

As mentioned previously, the use of wetting agents and rewetting agents often permits dyeing without preliminary boil. The action of uniformly wetting and dyeing does not eliminate the impurities and is not considered ideal. In the processing of heavy ducks (woven without starch size) the method is practical, particularly when dyed with vats, which necessitate a scour after dyeing and thus give clean fabrics. The use of true detergents during dyeing can be considered practical on certain qualities of rayon sized with soluble sizes of the gelatine type, or some of the newer polyvinyl alcohols and carboxy methyl celluloses. Another successful use is in the dyeing of rayon lining cloths processed by padding followed by jigging, a method used widely to eliminate side shading. A detergent of high wetting properties, and of the foamless type, can be employed during padding and be thus present during subsequent jigging to scour the fabric.

On wool the use of detergent-degreasers in an acid bath has been employed successfully, but is restricted to the non-ionic polyethylene agents. These emulsify spinning oils in an acid bath for application either before or during dyeing. The elimination of the customary alkaline prescour and rinse prior to acid dyeing is in itself a considerable advantage.

Reserving Agents for Union Dyeing

Auxiliary products of this type are used in direct dyebaths of animal-cellulosic fiber combinations to hold the dyestuff off the animal portion. They belong to the before mentioned type of dyeing assistants possessing affinity for wool. Theoretically all sulfonated products possess some degree of this reserving ability, but for practical use the alkyl aryl sulfonates and alkyl naphthalene sulfonates are of value, though easily surpassed by the sulfuretted phenol types which block the amino group of wool very effectively. Use on the alkaline side increases the retarding action.

Aftertreating Agents for Dyes

The true mordants, developers and aftertreating salts are not considered part of the auxiliary group, and we will not discuss them here. Products of the quaternary ammonium type with dye-fixing properties are considered to react with the direct dyestuff itself to form a complex which is less water soluble and sometimes actually wash fast. The lowered light fastness and the change in shade of the dyes are unfortunately still a disadvantage to the universal adoption of these agents. These factors are caused by salt substitution and inherent weakness to light of the less stable molecular complex.

Detergents used to eliminate excess of color, reduce surface color and improve crocking fastness are truly dye bath assistants, even though usually applied in aftertreatments.

Naphthol dyes are rendered crock fast by the use of appropriate combinations of non-ionic detergents and the newer amino carboxylate salts which correct water hardness, render lime salts soluble, and allow the detergent to remove excess surface pigment.

Vat dyed material is usually oxidized with bichromate and acetic acid, followed by a quick rinse and soaping. On heavy fabrics some of the chrome salt easily may remain on the fiber and form chrome soap, which when dried imparts a certain degree of water repellency to the fabrics.

Obviously such a condition may interfere with subsequent finishing operations, due to insufficient wetting of the material and consequent improper absorption of water repellent and mildewproofing emulsions or other finishes. Finishes applied in solvents are not affected by poor water absorbency of the goods.

This condition is particularly apt to arise in tightly woven and heavy fabrics (ducks, tackle twill, etc.). The following remedies may be suggested:

(1) raising the temperature of the impregnating bath.

(2) the use of non-ionic detergents in the impregnating liquor containing the finishing agent.

(3) a spray rinse after oxidation with bichromate followed by scouring with acid-chrome stable synthetics in place of soap.

(4) using perborate or hydrogen peroxide as oxidizing agents in place of bichromate and acetic acid. This will completely eliminate the formation of chrome soap but is more expensive.

Optical Whitening Agents

The recent use of these products in soaps for household use has given added impetus to their application in the textile industry where they were known and used in small quantities for many years. Based on colorless dyestuffs, they have affinity for rayon, cotton or wool.

Heretofore, yellowish tints on white fibers were corrected by applying a bluing agent, either dyes or pigments, to create the illusion of white. Actually, whenever more coloring matter is added to a surface, the amount of light reflected is decreased and the surface becomes less white. Optical bleaching agents do not decrease the reflectance of light; in fact, they increase it because invisible ultraviolet rays are converted into visible rays. Some compounds convert with a reddish tint, others with a blue, violet or green tint. Those which convert with violet or reddish-blue tints, the intensity of fluorescence being equal, are most satisfactory for neutralizing or bluing the yellow or cream tint of unbleached or partly bleached textile or paper. Since the optical bleaching depends upon the presence of ultraviolet light, the maximum effect is obtained in clear daylight. They are practically ineffective in artificial light.

They can be used to supplement or eliminate bleaching or to increase the brilliance of pastel shades. When used on cotton or rayon, direct dyeing types having affinity for cellulosic fibers are used, while for wool, the types which exhaust in acid baths are best.

—— ♦ ♦ ——

December 4th Meeting, SE Section

THE Southeastern Section will hold its final 1948 meeting at the Atlanta Athletic Club in Atlanta, Georgia on Saturday, December 4. The meeting will feature a technical program session beginning at 4:00 P.M.

The technical program will consist of a presentation of the paper entered by this Section in the Intersectional Contest at the 27th National Convention in Augusta, Georgia. Dr. Howard M. Waddle, West Point Manufacturing Company, who was chairman of the committee preparing the paper, will present this paper. This paper will be followed by a Symposium on Starch which has been arranged by the Corn Industries Research Foundation who have asked technical representatives of the various starch industries to comprise a panel of experts.

At 7:00 P.M., the business session and banquet of the Southeastern Section will be held at the Atlanta Athletic Club. Members attending the banquet will hear Robert W. Philip, Vice-President and Director of Research of Callaway Mills Company, give a talk relating his experiences on his recent trip to England. A number of wives and other visitors are expected to attend the banquet.

Intersectional Contest—

VOCATIONAL TEXTS IN PRACTICAL WET PROCESSING

SOUTH CENTRAL SECTION

Committee:
Joseph H. O'Neill, *Chairman and Speaker*
C. Harrell Asbury
Glenn Bellamy
J. A. Crumley
Charles Gordon
E. V. Helms
A. J. Kelly
W. K. Newman
Stanley Shultz
H. A. Webb

IN the past decade the textile industry has come into its own and it stands today as one of the most attractive industries competing in a labor market which becomes increasingly selective with each passing year.

While the dyeing and finishing branch of textiles has made great technological strides through research and development within the industry, through its trade associations, and as the recipient of discoveries and advances made by dyestuff and chemical companies, it is in a position to lose ground in a selective labor market because of the inability of rank and file employees to bridge the gap to supervisory positions through lack of textbooks adjusted to their educational levels.

Elementary text material *(1)* is available to the manufacturing branch of the industry and many of the executives and key men in mills today received their original incentive at state-sponsored vocational classes held in the mills. Such courses and texts were prepared with the level of the average employee in mind and designed to aid his gradual and systematic progress to the more advanced knowledge required in supervisory positions. The stimulation of interest and encouragement offered by completion of these elementary courses resulted in many students continuing their efforts through more advanced and wholly individual study to further build on this foundation.

The advantage of such a training program to the mills is evidenced by its wide adoption in the industry and its renewal after wartime interruption. Many requests have been made to various state vocational authorities for courses in dyeing and finishing to be made available to plant employees and the answer invariably is that the only texts available presuppose an advanced educational background which would immediately discourage the average dyehouse or bleachery employee.

Here then is a problem, the practical solution of which would yield dividends by developing a personnel with the knowledge and resourcefulness needed to meet modern conditions. Encouragement by management and provision of the necessary tools to achieve advancement in this branch of the industry would do much to preserve the workers' faith in the traditional American way.

History

Attempts have been made in a few Georgia plants to provide courses in elementary physics, chemistry, and dyeing in cooperation with the industrial education services of Georgia Tech and the State Department of Education wherein a dyeing overseer or chemist volunteered to prepare his own material and proceed with lectures, quizzes, and laboratory demonstrations or experiments. The value of such courses was dependent upon the instructor's willingness to assume the burden of preparing suitable material, his ability to hold the interest of his group by practical illustrations of the connection between plant problems and theories being studied and his recognition of the need for both individual and collective instruction.

The dyer or chemist instructor was handicapped by lack of time for preparation and limited to his own experience for practical examples so that he was unable to keep his group interested and active over a long period. The attempts were, therefore, of short duration and the instruction material not adaptable to general use. Since the interest created among student employees was reflected in their better work, the net result was additional proof of the need for such a fundamental training program.

Available Vocational Material

A Georgia bulletin on vocational textile education *(2)* covers the purpose, subjects and methods used in detail, and is characteristic of the vocational trade-extension classes of textile mills from Virginia to Texas. The majority of courses of study adaptable to almost every conceivable need in cotton manufacturing have been standardized, adopted and issued by the various states. This material sets a general pattern developed through trial and error over a period of many years. Wet processing texts when written should conform to it.

The basic instruction in these courses is "Cotton Mill Mathematics," *(1)* which was designed specifically for the purpose, beginning with reading of numbers and proceeding through elementary phases in the usual mathematical order, but with all problems phrased in terms of mills, mill equipment, manufacturing operations, products, inventories, costs, and similar concepts that are familiar, immediately useful, and therefore highly interesting to the pupils.

The basic mathematics in Part 1 of this book is applicable for taking the student through the elementary mathematical processes required. The last five chapter headings in this section indicating the extent of training to this point are as follows:

XVI. Percentage.
XVII. Measure of Weight, eLngth, Time, Area, and Volume.
XVIII. Square Root.
XIX. Ratio and Proportion.
XX. Pulleys, Gears, Belts, and Levers.

* Presented in Intersectional Contest, Augusta National Convention, October 23, 1948.

Experience has proven that while the actual text and order of progression in this book are ideally suited to the purpose, the problems as stated in strictly cotton mill terms do not hold the interest of the student employed in wet processing. Revision of the problems and illustrations to everyday bleachery and dyehouse work would vitalize the course and also gradually serve to introduce and familiarize the student with the nomenclature encountered in later study. Part 2 of this book has several chapters devoted to yarn, twist, draft, cloth, and machine calculations. Any proposed revision for a dyeing and finishing text should include in a Part 2 the special yarn, cloth, volume, and formula calculations necessary with a chapter on conversion factors and their uses. Consideration has been given to this need but very little has been accomplished to date.

Limitations

Consultation with authorities in this field has revealed the following as the principal limiting factors:

TIME.—A ten week period in the fall and ten weeks in winter with two hour classes two nights each week has been uniformly adopted for this type of training. Credit cards are issued for each unit of a full course which the average student completes in 3 to 4 years to receive a diploma which is standard all over the South.

SUBJECT MATTER.—In view of the limited time of the pupils and the broad field to be treated in wet processing texts, coverage of each phase must be restricted to bare essentials. The allotment of subject matter to each phase must, therefore, be governed by its relative importance after a complete survey of the entire field.

STUDENTS.—While the average educational level of employees becomes higher each year, many of the prospective students drawn from large rural areas were unable to finish grade school. All contemplated texts must allow for very gradual progression of these students and be written with a sympathetic regard for their background. It must also be adaptable to individual instruction so that each student may progress according to his ability.

INSTRUCTORS.—It is understood that plant foremen and chemists or technicians would conduct these mill classes in accordance with vocational trade-extension practice. It must be recognized that the ability to interpret scientific data into terms of practical everyday work is the thread upon which the success of such courses must hang. The instructors must therefore be supplied with text material in which a studied effort has been made to present scientific data in terms of simple occupational English and with visual aids so far as is practical.

Elementary Material

The need for elementary works in the fields of preparation, bleaching, dyeing, and finishing has long been recognized; prior to the first World War the independent dyestuffs and chemical companies of Europe published pocket guides and handbooks for use by overseers and apprentices. In later revisions of such useful books *(3) (4)*, new developments such as the dyeing of rayon fibers and use of naphthol colors were included; but the newer synthetic fibers such as nylon had not passed the development stage, while the processing of silk was covered in greater detail than its current position warrants. The demand for proprietary handbooks printed in this country in limited editions, such as, "Modern Methods of Dyeing," *(5)* and "Popular Industrial Chemistry," *(6)* emphasizes the desire of industrial workers for this type of trade knowledge.

A very complete bibliography of textile books is carried in each AATCC *Year Book*, some few of which we list in the Appendix as useful references. Each *Year Book* also carries a bibliography of all papers published by textile journals on semi-technical and technical subjects; a search of this section would probably produce worthwhile contributions in the preparation of texts.

Considering the wealth of data published on this general subject, surprisingly little is available in text form. The industry is indebted to such men as J. M. Matthews *(7)* and C. M. Whittaker *(8)* for their early works and revisions which have been in use for many years. The combination of scientist, educator, author, practical expert and interpreter in this field is exceedingly rare; modern diversification has so broadened the scope of subject matter that full coverage in text form by individuals is highly improbable in the future. Preparation of the desired vocational texts can be accomplished, however, by collaboration of the many experts in their several fields as represented in our AATCC organization, with representatives of the state or federal vocational education authorities who have been notably successful in producing practical texts and in the organization of industrial education.

Job Educational Requirements

In many industries where organized apprentice or key worker training has been fully developed there are available occupational analyses, classifying the technical knowledge and auxiliary information necessary for an understanding of each job and each operation. Such a breakdown in the wet processing of textiles would clearly demonstrate that an understanding of precise quantitative relationships in practical production is basic; completion of the mathematics course is therefore the first necessary step.

The next requirement for a key worker in our industry is a knowledge of elementary chemistry and physics sufficient to provide a grasp of the fundamental laws and theories underlying the chemical reactions involved in the various processes. This knowledge need not extend to the detailed properties of the many elements with all of their symbols and valences nor to the balancing of intricate equations necessarily included in courses designed to prepare students for advanced chemistry but should cover simple examples illustrating those phases commonly encountered in everyday work. This training in chemical theory will provide the background necessary to master its application in additional requirements, which could be met by a study of texts to be proposed in wet processing theory and a final study of practical applications in wet processing.

Proposed Outline of Study

Division A—Elementary Mathematics—Part 1, for those who need it.

Division B—Mathematics—Part 2, for all students. Completion of this subject to serve as entrance requirement for:

Division C—Chemical Theory. The initial phase of this subject should follow closely the pattern that time has proven to be the natural order of learning, with definitions of such concepts as science, matter, energy, physical change, and chemical change, following the usual breakdown, such as, elements, classification of elements, symbols, compounds, mixtures, properties of matter, physical properties and chemical properties. The examples must be drawn from workday experiences, allowing the worker to proceed from a grasping of the ideas underlying the facts with which he is familiar to those fundamental but unfamiliar ideas and facts which explain the hidden principle he must otherwise blindly follow.

It is recommended that brief chapters should then be taught in the following order:

1—Atoms and molecular theory of matter.

2—Oxygen and its properties.
3—Hydrogen and its properties.
4—Water—its composition and properties.
5—Solutions, suspensions, and dispersions.
6—Acids, bases, neutralization and salts.
7—Oxidation and reduction.
8—Ionization—pH as a practical tool.
9—Review of chemical theory supplemented where possible by use of instructional films. *(9)*

Division D—Wet Processing Theory.

Section (a)—Study of Fibers. This section should be confined to those fibers in principal use with cotton and wool representing the natural fibers, and viscose and acetate rayons and nylon, representing the synthetics. Treatment of these should be elementary, covering:

1—Chemical and physical properties—both wet and dry.
2—Modification of properties, such as mercerization of cotton and saponification of acetate.
3—Affinity for dyestuffs.
4—Need of, and method for, preparation before dyeing and finishing.

Section (b) Bleaching.

1—Chemical methods in use.
2—Batch and continuous methods in use.

Section (c)—Dyeing.

1—Chemical, physical and colloidal theories.
2—Types of dyes and general fastness properties of each.
3—Laboratory applications of each type.
4—Color matching theory and practice.

Section (d)—Mechanical Processes.

1—Raw stock—open and closed systems.
2—Yarn—in the forms of beams, packages, skeins and chains.
3—Fabric—Knitted fabrics and woven piece goods, rope and open width.

Section (e)—Textile Chemical Auxiliaries.

Section (f)—Finishing.

1—Properties imparted to fabric.
2—Chemicals used.
4—Typical running formulae and time cycles.
5—Sampling and shade adjustment.
6—Control problems.

Division E—Practical Applications in Wet Processing—A pamphlet or manual in text form for each phase of application. As an example, the suggested coverage of a dyeing machine might be as follows:

1—Mechanical operation.
2—Adjustments for different fabrics or loads.
3—Adaptability to applications of various type dyes.

Discussion

It will be noted that the first four divisions in the proposed outline of study have concentrated on theory so that the students would be prepared to attend practical classes in the several phases of operation available in their own plants. At this point their familiarity with the nomenclature and technical matter of a practical text should enable them to follow the overseer-instructor intelligently in his translation from theory into actual practice and the solving of problems incident to production.

The mathematics and practical courses available to the manufacturing branch of the textile industry are the result of contributions for many mill men and interested firms, with the state vocational authorities coordinating and compiling the information into workable texts. The material for texts in the proposed *Division E* should likewise be contributed by men in the industry and the technical departments of firms serving the industry.

Visualizing such a program, the many branches of wet processing would have available in pamphlet form practical texts covering the particular phases of operation they wished to teach; the joint efforts of those contributing would result in a complete and up to date source of information which should reward them far beyond their individual efforts.

In addition to proposing the foregoing method of attack on this problem and working out a suggested outline for its accomplishment, certain members of this committee have written material on the phases with which they are familiar, and offer them in whole or part to any group willing to sponsor this project. We submit as an adjunct to this paper, *"Cotton Printing,"* by H. A. Webb, and *"Textile Auxiliaries"* by A. J. Kelly. These articles are not in the form of texts, the preparation of which we consider to be the function of specialists in their particular field but are offered as typical of the contributions which might be received on these and other phases to form the basis for practical texts. Other men have indicated their willingness to make similar contributions if and when an agency is created to compile the material and carry out the objective.

Conclusion

In a selective labor market, the higher type of prospective employee will be attracted to this fascinating branch of the textile industry if training in the fundamental science necessary to advancement is available. Such trained employees will assure that new applications resulting from the many intensive research programs now under way will be carried out intelligently at the operating level.

In 1922, William C. Dodson closed his book *(10)* with the following note, "This effort has been put forth with the sincere hope that it will tend to stimulate similar action on the part of those who are capable of dealing with the entire subject of practical dyeing. Action that will appear in the form of simply written, reliable treatises that can be understood by the men in the dyehouse as well as by the college trained chemist." In 1948, the hope expressed by Mr. Dodson has not been realized. We have merely broadened the scope to include the entire field of Wet Processing and suggested the dual agency of millmen and educators in the belief that action as proposed herein will serve as a practical approach to the solution of this problem.

Acknowledgments

We are especially indebted to Thomas H. Quigley, Professor of Industrial Education, Georgia School of Technology, for advice and material from his department; also to Dr. Raymond B. Seymour Director of the Special Products Research Division, Johnson & Johnson Co., and Ernest A. Freeman, Jr. of the Riegel Textile Corporation, Trion Division, for review of the manuscript. Reference material was contributed by the following firms:

Burkart-Schier Chemical Company.
Ciba Dyestuffs Company.
Coronet Instructional Films.
E. I. DuPont de Nemours & Company, Inc.
Wallerstein Company, Inc.

References Cited

(1) Quigley and Smith, "Cotton Mill Mathematics", Turner E. Smith & Company, Atlanta, 1934. The I.C.S. "Cotton Manufacturing Texts", International Textbook Company, Scranton, Pennsylvania. The Willis et al. "Cotton Manufacturing Texts", Clemson College, Clemson, S. C. The Merrill "Cotton Manufacturing Texts", Lowell Textile Institute, Lowell Massachusetts.
(2) Bulletin No. 2, "Vocational Trade-Extension Schools in the Textile Mills of Georgia." Industrial Education Department of Georgia School of Technology, Atlanta, Georgia.
(3) ————, "Manual for the Dyeing of Cotton and Other Vegetable Fibres", General Dyestuff Corporation, New York, 1946.
(4) ————, "The Dyestuffs of the Society of Chemical Industry in Basle", The Society of Chemical Industry in Basle, Switzerland, 1936 three volumes.
(5) Pierce, E. W., "Modern Methods of Dyeing", Ciba Company, Inc., New York, 1940.
(6) Branegan, James A., "Popular Industrial Chemistry", Kali Manufacturing Company, Philadelphia, Pa., 1934.
(7) Matthews, J. M., "Application of Dyestuffs", John Wiley & Sons, Inc., London, 1920.
(8) Whittaker, C. M., "The Application of the Coal Tar Dyestuffs", D. Van Nostrand Company, 1946.
(9) ————, "The Index of Training Films", Second Edition, prepared by the Editors of Business Screen Magazine, 1947.
(10) Dodson, William C., "Remedies for Dyehouse Troubles", Clark Publishing Company, Charlotte, 1922.

Appendix

American Viscose Company, "Rayon Technology Handbook for Textile Mills", McGraw Hill Book Company, 1948.

Clark, J. A., "Finishing Materials", W. R. C. Smith Publishing Company, 1939.

Fox, M. R., "Vat Dyestuffs and Vat Dyeing", John Wiley & Sons, Inc., New York, 1948.

Hall, A. J., "The Dyeing of Cotton Fabrics", New York, 1927.

Harper, H., "Introduction of Textile Chemistry", Macmillan and Company, London, 1939.

Hathorne, B. L., "Rayon Dyeing and Finishing", New York, 1934.

Hoff, G. P., "Nylon as a Textile Fiber", American Dyestuff Reporter, February 17, 1941, P. 85-87 and 105.

Horsfall, R. S. & Lawrie, L. G., "The Dyeing of Textile Fibers", London, 1927.

Knecht, Rawson and Leewenthal, "A Manual of Dyeing," two volumes, London, ninth edition, 1933.

Monaghan J. F. "Processing and Finishing Cottons" two volumes Frank P. Bennett & Co. Inc. Boston 1935.

Olney Louis A. "Chemical Technology of the Fibers" 10th edition Lowell Textile Associates 1947.

Paterson David "Textile Colour Mixing", London, 1927.

Trotman, S. R., "The Bleaching, Dyeing and Chemical Technology of Textile Fibers", Charles Griffin & Company, London, 1925.

————, "Use of Enzymes in Preparing Fabrics for Dyeing", Silk and Rayon, September, 1946, 20:1112, 1115-17.

COTTON PRINTING

An Adjunct of the Paper of the South Central Section on Vocational Texts

H. A. WEBB

Introduction

YOU have studied the classes of dyestuffs and their application to the fibers by dyeing. This chapter is devoted to the application of those dyestuffs by machine printing. In printing, the dyestuff is applied in a definite pattern to the cloth by mechanical means and then by subsequent aftertreatment a fixing action of the dye takes place in the desired outline or pattern.

In newspaper printing a raised type or engraving is used to transfer the ink to the paper. In textile printing an inverted type of engraving is used and the dye suspended in a thick paste is transferred by extreme pressure from the depressions of the engraving to the cloth.

The Printing Machine

The central cylinder of this machine is made of cast iron or steel. All parts of this machine including the cylinder are adjustable with the sole exception of the star gear, this being necessary due to the variable circumference of the engraved copper roll. The star gear drives the engraved rolls which in turn drive the entire machine. The cylinder is lapped or wrapped with several layers of a very heavy tough fabric made of linen and wool. Next to this lapping runs an endless blanket of fabric-rubber composition and against the blanket runs a cotton fabric known as a back grey which is griege cloth. This back grey, being between the cloth to be printed and the blanket, protects the blanket by absorbing all the excess color paste that is forced through and around the selvages of the cloth as it is being printed. It should be noted that in some shops with certain lines of work that a back grey is dispensed with entirely. This is made possible by the use of a longer canvas rubber embossed blanket and a blanket washer which has been developed in recent years. The endless blanket runs through the blanket washer where all color pastes are removed and the blanket is dried.

The engraved roller is made of copper, is usually very thinly plated with chromium to give it a hard surface, and is eighteen or sixteen inches in circumference, depending on the size of the object to be printed. Larger rolls are sometimes used for special work, such as tablecloths. The cloth passes between the engraved roller and the back grey, which you have noted, is supported by the cylinder and blanket. The engraved roller is a cylinder with a wall thickness of approximately one inch. A steel rod or mandrel is inserted in the roller and to each end of this mandrel pressure is applied to force the engraved roller against the cloth. Sufficient pressure is used to transfer the color paste from the depressions of the engraving to the print cloth and further to effect the necessary penetration of the cloth.

Fixed under the engraved roller is a color box containing the color paste to be printed. Turning in this paste is a furnish roller made of wood, or it may be a brush roller. This furnish roller turns against the engraved or print roller smearing it completely with the print paste. A metal blade called a doctor blade scrapes against the engraved roller wiping it clean of the print paste except that which remains in the depressions of the engraving, and in that manner the design of the engraving is transferred to the print cloth. That excess color which is scraped back by the doctor blade flows down into the color box.

With some fabrics lint is picked up by the print roller and if allowed to accumulate in the color box or to stick under the doctor blade it will cause streaks in the pattern on the cloth. When printing some multicolor styles, which require a series of engraved rollers, color fixed on the cloth by one roller may be in a small degree picked up by a following print roller and therefore mixed in with its print paste, causing a shading or discoloration of the paste in the latter color box. To remove this carry over color and to pick off lint that may become stuck to the print roller, another scraper blade called a lint doctor is used. The lint doctor scrapes against the engraved roller as it turns from the print cloth, cleaning it before the engraved surface passes over the furnisher roll to pick up additional color. By use of the lint doctor, lint or foreign color is therefore removed and not carried into the color box by the print roller.

After the printed cloth leaves the machine, it goes to the drying cylinders or dry cans where it is dried. After drying, it is then given the necessary aftertreatment for development of the dyes used.

Print Pastes

As stated before, it is the purpose of the paste to act as a vehicle for the dye to be printed. Many thickening agents have and can be used. Probably the most widely used, due to its low cost, is corn starch and the various derivatives of corn starch. Other thickeners, such as wheat starch, gum tragacanth, British gums, dextrines, locust bean gums and gum Arabic,

are used where their characteristics are particularly adaptable for certain applications. These have to be cooked before they can be used.

In addition to these natural gums and vegetable starches, the soluble cellulose gums, such as carboxy methyl cellulose are now being used in increasing quantities. These compounds require no cooking and are more easily removed from the fabric in the soaping operation, thereby giving a softer hand.

In dyeing you learned that a great majority of the formulas were calculated as percentage of the goods to be dyed. In printing it is general practice to record the strength of the pastes and colors in ounces per gallon.

Agers

There are many types of agers employing either steam, or acid and steam. The neutral steam ager contains a steam injection line. The acid ager in addition to the steam requires the injection of acetic and or formic acid or an evaporation of these acids. Straight acetic acid is sufficient for Rapidogen type colors whereas a mixture of acetic and formic acid is preferred for the Algosol or Indigosol type colors. It is usually desirable to maintain an ageing time from three to five minutes as may be necessary with the dyestuffs used. However, with certain types of work, ageing times of forty-five minutes to one hour are required to properly fix the dyestuff on the fiber.

Printing with Various Classes of Colors

BASIC DYESTUFFS.—You have learned that in dyeing basic dyestuffs it was necessary to prepare the bleached goods with a mordant, fix the mordant, and then apply the dyestuff. In printing, the mordant and the dyestuff are mixed together, applied to the fiber on the machine, dried, and then steamed in the neutral steam ager to fix the mordant and the basic dye on the cotton fiber. Acetic acid is used to prevent a premature formation of the color lake by the dye and the tannic acid mordant in the print paste.

A combination of wheat starch and gum tragacanth is popular for printing basic colors. A typical print paste may contain dye, acetic acid, wheat starch, gum tragacanth, water, and tannic acid solution.

MORDANT COLORS.—These are acid dyes but are commonly called chrome colors in view of the fact that chromium acetate is usually used as a fixing agent. For special colors the acetate salts of aluminum, iron and tin are also used. Since these colors work similarly to the basic colors and can generally be classified as having the same fastness properties they are sometimes printed together, particularly in view of the fact that the brighter basic colors support duller chrome types. The mordant colors are printed in a paste made of starch and gum tragacanth. They are dried and aged in neutral steam to effect the breakdown of the acetate salts and the subsequent formation of the color lake on the fiber. The basic and mordant dyestuffs due to their fastness limitations are, as a rule, printed on the cheap classes of cotton fabrics, and in these cases are not soaped after ageing but are finished or put up with the printing starches and gums left in the goods. Certain chrome colors, however, do show good wash fastness and can be used where wash fastness is desired. These are given an alkaline soaping at 140° F. Some basic color prints may be given a light soaping at not over 120° F.

DIRECT DYESTUFFS.—Whereas these colors are very important to the dyeing trade they are not used nearly as extensively in printing because of their limited fastness to washing, and because of the excessive ageing time required. Those types offering good light fastness are used where such properties are particularly desirable and where the limited wash fastness or water fastness is not a handicap. The direct dyestuffs are printed in a neutral paste, are dried and then steamed in neutral steam.

VAT DYESTUFFS.—You have learned of the maximum all-round fastness of the vat colors which has made them the most important group of dyestuffs in the dyeing field. For the same reason, they hold a prominent place in the printing of cottons. In dyeing it was noted that the vat color pigment was insoluble in water and that it could be reduced to the leuco state with the aid of hydrosulfite in an alkaline medium. In this state, it has the same dyeing characteristics as the direct dyes and after application to the fiber, is oxidized to its insoluble state and subsequently soaped to give full development of shade. The same cycle is used in printing; however, instead of using sodium hydrosulfite as the reducing agent a modified hydrosulfite which has been treated with formaldehyde to form sodium sulfoxylate is used. This compound gives the same reducing effect but only at the high temperature encountered in the steam ager and this after the formaldehyde has been driven off by the heat. Sodium hydrosulfite could not be used in the print paste, as partial reduction of the dyestuff would take place at the machine. Due to the alkali necessary to support the reducing action, a thickener has to be used that is not too sensitive to alkalies such as British gum or a mixture of British gum and wheat starch. Where full reduction can be obtained, potash or soda ash is substituted for the caustic soda that is used in dyeing vat colors as these alkalies do not have the mercerizing effect on the printed areas and they are not as harsh on the back greys. The vat color is therefore printed in a paste made of dye, printing gum, sodium sulfoxylate, potash and water. Where desired, glycerine may be used to obtain hygroscopicity and lubrication. The print is then dried, aged in the neutral steam ager, and taken to a soaping range where it is oxidized, as in dyeing, and subsequently soaped.

SOLUBLE VAT COLORS.—These dyestuffs, known as Algosols or Indigosols, are vat colors that have been reduced and stabilized in the reduced state. They, therefore, are water soluble and no reducing action is needed to dye or print these types. They are applied with an acid forming agent and an oxidizing agent, dried and subsequently acid or neutral steam-aged as may be desirable. When acid ageing is used the acid splitting agent is not necessary as the acid fumes are sufficient to develop the dyestuff. In addition to acid steam ageing and to neutral steam development by incorporating an acid splitting agent in the print paste, the Algosols and Indigosols may also be wet developed by passing through a bath of sulfuric acid and sodium nitrite. These dyestuffs are therefore, very versatile and flexible in application. A typical formula for acid ageing, known as the chlorate method, would be to paste the dye with glyecine (a solvent), add an equal amount of urea and dissolve with warm water, thicken with a starch-tragacanth paste and add sodium chromate (which is the oxidizing agent), print, dry, and age in the acid ager. After ageing, the goods are soaped to fully develop the shades and remove the printing gums.

NAPHTHOL COLORS.—In dyeing, you were told of the formation of the insoluble color lake on the fiber by coupling a naphthol and a color salt or color base together. This same operation is carried out in printing by pad dyeing the naphthol on the fabric and printing the desired design with the color salts. That area of the fabric that has not been developed by printing of the color salt is covered by the dried naphtholate and in the soaping operation this naphtholate is removed to give a white ground. Wherever it is practical, the naphthol colors are used due to their excellent fastness

properties, their comparative low cost and their ease of application. However, since the uncoupled naphtholate on the cloth is a total loss, the use of these colors is usually limited to those patterns where the design to be printed covers at least fifty percent of the total area of the fabric. Naphthol AS is almost exclusively used as the naphthol for preparing the naphtholated cloth due to its good all round fastness with the various developers and its comparative low cost. Other naphthols are used only where some exceptional characteristics of shade or fastness is desired. The Naphthol AS is dissolved by conversion to its sodium salt or naphtholate and is padded on the cloth, which is dried and sent to the print machine. The color salts are dissolved in water made into a print paste usually with wheat starch and an addition of acetic acid since the fast color salts are only stable in an acid medium. The color salt print paste is printed on the naphtholated cloth. No ageing is necessary and development of the shade may be observed as the printed cloth leaves the machine. Since the color salts are not stable in warm or hot water, it is necessary in some print shops to cool the fast color salt print pastes with ice or with refrigeration and for that reason, these types are sometimes referred to as ice colors. After printing, the goods are dried and then taken to the soaper. Here the excess naphtholate is stripped from the goods with the aid of acetic acid or oxalic acid, and are subsequently soaped clean and dried. The soaping is also necessary in order to obtain the true shade of the naphthol combination and to obtain the maximum fastness to washing, light, and to chlorine.

RAPIDOGEN TYPE DYESTUFFS.—These dyestuffs, known as Rapidogens, Pharmasols and Diagens, are stabilized insoluble azoic combinations made from the naphthols and offer the same range of shades and fastness properties as the naphthols. They are combinations of naphthols and fast color salts that are held in a stabilizer mixture and inhibited from coupling until they are placed in the presence of acids. These dyestuffs are dissolved by conversion to the sodium salt with caustic soda in the same manner as the naphthols and are then water soluble. They are dispersed in thickeners that are not too sensitive to alkali, printed, dried and acid aged. After ageing they are soaped as are the naphthol and vat colors to develop the shade and to insure the best in fastness. A typical color paste for these colors may be made by pasting the dyestuff with Cellosolve and adding the necessary caustic to effect conversion to the solution. This dyestuff is then added to the thickened paste containing a small amount of caustic soda as a primer and also containing a small amount of acid dye as a sightening color. Many of these types may be dissolved by pasting with the required amount of liquid caustic and then adding a small amount of boiling water. In addition some types are marketed in solution form being already dissolved which is very convenient and easy for the color shop to handle.

Since Rapidogen type dyestuffs require acid ageing and the soluble vat colors known as Algosols and Indigosols also require acid ageing they are frequently and, as a rule, used in combination for high quality work requiring the best in fastness properties. As Rapidogen type colors offer all shades that are available from the naphthols, and the Algosols and Indigosols offer the bright blues and greens lacking in the naphthol line, it is possible and quite practical to print any shade desired.

Besides acid steam ageing the Rapidogen types may also be aged in neutral steam and therefore printed together with vat colors. With this method a volatile organic alkali rather than a fixed alkali such as caustic soda is used to prepare the print paste. This volatile compound then breaks down in the neutral steam ager, allowing development of the stabilized azoic colors at the same time the reducing agent in the vat colors effects their reduction.

ANILINE BLACK PRINTING.—Aniline black is one of the fastest and cheapest blacks and it is used wherever it is practical to do so. It is classed as an oxidation black and is another incident wherein the dyestuff is formed on the fiber. There are several formulas for the application of aniline black. In one popular method, the aniline salt is dissolved with hot water and allowed to cool. An oxidizing agent such as sodium chlorate is then dissolved separately and allowed to cool. An oxygen carrier, potassium ferrocyanide (yellow prussiate), is dissolved with hot water and mixed with the printing gum. When these three components have cooled, they are mixed together, printed and aged in a neutral steam ager with moist steam. After ageing, the fabric is treated in a bath of soda ash and sodium bichromate where the final shade of black is obtained. The cloth is subsequently soaped as other fast colors.

PIGMENT COLORS.—The use of this type color has shown increased popularity during recent years due to its relative ease of application and comparatively low cost. These colors show good fastness to chemicals, light, and washing, but are limited in their fastness to crocking or rubbing, particularly in heavy shades. They are very bright colors and for that reason the use of pigment blues and bright greens is popular in conjunction with the Rapidogen types when printing some styles not requiring maximum fastness.

While the other dyes you have studied are printed with starch or gum thickeners, the pigments are printed in water insoluble resins which have been made into emulsions and not only act as carriers for the pigments but are the fixing agents which, when dried on the dry cans or in a hot air drier, bind the pigments to the fibers. With all other classes of colors you have either dyed the fiber or have made the dye or color lake on the fiber whereas with the pigments a purely mechanical fixation is accomplished.

These colors are dried after printing. To obtain maximum fastness, they should be dried or cured at 300° F.

DISCHARGE PRINTING.—Since it is possible to strip many direct colors and diazotized and developed colors, a type of printing known as discharge printing is used to produce some styles and patterns. The cloth to be printed is first dyed with the direct color or the diazotized and developed color, according to the fastness requirements. If a white pattern is then desired, as is the case with a white polka-dot, a discharge paste is made up of the sodium sulfoxylate, alkali and starch. You have noted that sodium sulfoxylate is used in printing vat colors since it breaks down only at the high temperatures encountered in the ager and for this same reason it is used in the discharge paste to strip the color. After printing, the material is dried and then aged in neutral steam where the stripping or discharging takes place. In certain instances, it is desirable to use titanium dioxide in the discharge paste as an assistant in obtaining clear whites. The titanium dioxide in the discharge paste is used as an assistant in obtaining clear whites. The titanium dioxide is a very bright, white pigment and is quite effective for this purpose. If maximum wash fastness is desired, selected combinations of naphthols may be discharged in the same manner to produce satisfactory whites.

You, no doubt, have noted that the same ingredients of a discharge paste are used in vat color printing pastes so it is, therefore, quite practical to print vat and discharge ground colors with the same paste and this type of work offers a wide variety of styles and color combinations. This type of printing is very popular in the dress goods field.

Emphasis has been placed on the types of printing that predominate in industry of today. It is designed to present the subject in an elementary manner for use by practical instructors who should be in a position to fill in the gaps. It would be impractical to enlarge this text to cover the voluminous data and contingencies encountered in such a highly technical operation as textile printing.

TEXTILE AUXILIARIES

An Adjunct of the Paper of the South Central Section on Vocational Texts

A. J. KELLY

Introduction

IN the production of textiles, whether cloth or finished garment, the fundamental acts of spinning and weaving are generally familiar and readily understood. In spite of the apparent complexity of modern mill machinery for the manufacture of yarns and fabrics we know these devices stem from the household arts of the spinning wheel and the hand loom. Even of our first parents we read "When Adam delved and Eve spun. . ." The primary wet-processing operation, that of dyeing, is equally familiar and almost as ancient. Spinning (making thread or yarn), weaving (making cloth), and dyeing (or coloring)—these three are basic; on this basis is readily made the elementary breakdown of textile production into two phases, dry and wet. Dry processing obviously covers the mechanical and physical steps of actually *making* the yarn and fabric. Wet processing is concerned with the coloring or dyeing and bleaching and further with all of the processing which is done wet or in a bath of water. It is this latter series of operations which will be considered here.

Since under the term "wet processing" is blanketed a great number of procedures in the manufacture of textiles, some further exposition is desirable. It is basically a three-fold activity; preparation, bleaching or dyeing, and finishing. Preparation would include all of the work done to ready the material for coloring. Bleaching is naturally included with dyeing since it may readily be considered as "coloring white" although no dyestuffs as such are used. Finishing, as will be seen, is an all-inclusive term; it may be a simple bluing or soaping or rinsing, or on the other hand, a whole series of complex treatments almost too numerous to mention. It includes sizing or starching, softening, crease proofing, shrink proofing, mildew proofing, moth proofing and many others. For every phase of wet processing, auxiliary products are manufactured and used.

What is a textile auxiliary? Essentially it might be said to be any component of a wet processing bath other than the textile material and the water. Such a broad classification would include all dyestuffs, bleaches and basic chemicals such as acids, alkalies and salts used. The term is more commonly restricted to the agents which are employed to aid, expedite or improve the fundamental dyeing and finishing, or to obtain special effects not inherent in a plain dyed textile. Another term, "Textile Chemical Specialty," is practically synonymous with "Textile Auxiliary," and under this heading we find listed in the *Year Book* of the American Association of Textile Chemists and Colorists over a hundred sub-groups. While many of these subdivisions are duplications, the extensive listing is an indication of the great number and variety of auxiliaries offered, and conversely of the very real needs which they fill. It can be confidently stated that every mill doing wet processing uses one or more, and probably more, of the auxiliaries in the list mentioned. For clarity and convenience, the various auxiliaries will be considered here in relation to their application rather than their nature; and in the normal sequence of mill procedure.

Preparation

SCOURING.—To prepare textile fibers (whether in the form of raw stock, yarns or fabrics) for dyeing and bleaching, the prime need is cleaning. Cotton from the field and wool from the sheep's back each have present substances which are not part of the natural fiber and which are not desirable in the finished garment or material. Bits of leaves, stalks, normal soil or dirt on cotton, trash and stains of nearly every sort on wool. The man-made fibers such as rayon or nylon have oil or other matter picked up in manufacture or handling, while silk has a high percentage of natural gum to be removed in addition to the usual contaminants. Hence the need for washing, or as it is more commonly called scouring, to remove in one way or another the bulk of this foreign matter. Some of it is removed mechanically, in making the yarns, but when the material reaches the dyehouse in the "greige" or undyed natural state there is still much to remove and a vigorous cleaning or scouring is generally needed. Because of this simple need the textile industry consumes an immense tonnage of soap and alkalies as well as other cleaning aids and detergents.

DETERGENTS.—Even for the every day user it would be difficult to provide a completely acceptable definition for the word "detergent." As used here it will mean anything added to water to increase its effectiveness as a cleanser. This includes soaps, sulfonated oils, alkalies, synthetic products, as well as modifications and combinations thereof. The most familiar and certainly one of the most effective detergents is just plain soap. Even before soap came the use of rubbing stones, washing clays, and the like. These involved considerable rubbing or friction, and friction is still an important factor in rapid and effective scouring. The good points of soap hardly need repeating. However, it has certain disadvantages, some of them of much more importance in the textile mill than in the home. Soaps are adversely affected by hard water, they are alkaline in solution, and they cannot be employed in acid baths. The disadvantage of hard water can be met by the use of naturally soft waters or by the use of water softening systems; to some extent also by the addition of water softeners directly to the bath. The mildly alkaline reaction of soap solutions is not a great drawback for most textile wet processing, as fibers are not as a rule seriously affected.

However, the sensitivity of soap to hardness, and the desirability of detergents effective in neutral or acid baths for some operations, led to a great amount of work directed toward modifying soap or developing soap-like synthetics. This work was accelerated in both world wars by shortages of raw materials in some of the warring nations. Briefly, it has culminated in the modern synthetic detergents—used for many years in our industry but only recently reaching the retail and household markets. Such materials as Dreft and Drene and Swerl and the like are basically the same as some of

the synthetic detergents encountered in the textile mill. These products are not adversely affected by the hardness of the water—they do not form a scum or "ring around the bath tub." Some of them, like soaps, are based on natural fats and oils, others are of petroleum origin. As a class they have the added advantage of being effective in acid baths, and in baths containing high percentages of soluble salts and electrolytes. For instance many of the synthetics will do a good cleaning job in sea water. Typical synthetic detergents are the sulfated alcohols, the alkyl aryl sulfonates, and the various fatty amine complexes. Many modified detergents are made: these may be combinations of soaps and synthetics, soaps or synthetics and certain solvents, or of soaps and/or synthetics with specific alkalies. These are often employed for certain particular operations, such as cleaning oily or very dirty goods, in kier-boiling and alkali scours, and the like. Alkalies alone, such as caustic soda or soda ash or several of the phosphates, perform many scouring jobs.

APPLICATION OF DETERGENTS.—In applying detergents, the kind of goods and the results desired will influence the choice of type as well as the concentration and temperature of the bath. Generally speaking, the vegetable fibers such as cotton and linen are quite resistant to alkalies, while the animal fibers such as wool and silk are sensitive to alkalies and more resistant to acids. Some materials are scoured in boiling baths, others require lower temperatures and greater care in handling. The same is true of course in good household practice. The amount of detergent used is generally calculated as a percentage of the weight of the material being scoured—the range would be from 1 to 5 percent in most cases. The figure is controlled to some extent by the ratio of water to goods, which may run from 10 to 1 up to as high as 40 to 1. Such ratios are usually designated simply as 10/1 or 40/1. For instance, a 20/1 bath would contain 20 pounds of water for each pound of goods, or roughly about 250 gallons of water per 100 pounds of goods; this incidentally is a good average figure for hosiery processing. It should be noted that percentages based on the weight of goods are far less than solution percentages. In a 20/1 bath 5% on the weight of goods is equal to only one-fourth of one percent on the weight of water. Temperatures for scouring vary widely, from room temperature up to a full or vigorous boil; that is, from about 80° F. up to 212° F. Almost every type of equipment is used, from simple open tubs to elaborate ranges of vessels, both open and closed.

DESIZING.—Since washing or scouring is considered here as simply a preparation for bleaching or dyeing, some mention should be made of desizing agents. Before yarns are woven into cloth, they are often coated or "sized" with various starch combinations as a protection against abrasion or wear on the loom. After the cloth is made, it is usually necessary or desirable to remove the starches before dyeing and finishing. This may be done readily by employing agents known as enzymes which have the faculty of quickly "solubilizing" the starches through converting them into easily soluble sugars which rinse readily from the goods. The action is aptly known as digestion for this essentially is what it is. Some of the commonly used textile enzymes are derived from the digestive organs of animals, others are of vegetable origin.

Bleaching

Bleaching may follow scouring, and it has been well said that the secret of a good bleach lies in the "bleach bottom" (that is, in the scour which preceded it.) White goods have always had a tremendous appeal, and no doubt will always have. Bleaching is today almost exclusively a wet operation, but it was not always so. The art of bleaching textile fabrics such as linen and wool is of great antiquity. The Egyptians, Greeks, Phoenicians and Romans had white linen cloths but little is known of the methods they employed. We do know that, in the middle ages and beyond, bleaching was done by exposing the goods to the proper combination of light, air, moisture and time. About the period of Columbus' discovery of America (1492), brown linen manufactured in Scotland went to Holland to be bleached. It was sent in March and returned in October. Compare that with modern continuous or batch methods which yield thousands of yards of bleached goods hourly. It was in 1787 that chlorine was first used for bleaching and after that it was not long before the pleasant bleaching fields were gone forever, replaced by the buildings of the "chemical" bleachery.

BLEACHING AGENTS.—The principal bleaching agents used today are chlorine and peroxide—both in large volume. Chlorine bleaches are applied mainly to cotton and other cellulose fibers; peroxides are suitable for practically all fibers. Like the carbon dioxide of the soda fountain and the soft drink bottler, chlorine is a gas at normal temperatures and pressures. It becomes a liquid under high pressure and is sold in this form in small iron cylinders of 105 or 150 pounds net, in ton containers, and in tank cars containing many tons. For use it is released into a solution of alkali in water which combines with or "fixes" the gas in the form of a soluble relatively stable hypochlorite. Diluted, this forms the chlorine bleach bath. Much chlorine for bleaching is purchased in the form of a liquid sodium hypochlorite, more concentrated than it is normally made in the mill. For use this bleach liquor is diluted in the ratio of about ½ to 1 gallon to 100 gallons of water.

Peroxide is available as a liquid solution containing 30% or more of hydrogen peroxide, and as a dry powder or granular sodium peroxide. The latter reacts readily in water to form hydrogen peroxide and sodium hydroxide (caustic soda). Usually the caustic formed is neutralized with sulfuric acid—this however is not necessary in all applications. Since peroxide is a suitable bleach for practically all fibers, it is a versatile material, and in some instances will be found to be the only bleach practical; for instance, when dealing with materials made of mixed fibers. Much of the continuous bleaching of cotton piece goods is done with peroxide. It will bleach some substances more effectively than can be done otherwise. Occasionally cotton goods are given a pre-scour or "half-bleach" with sodium peroxide (without neutralizing the caustic) and "topped off" with chlorine. There is little likelihood that either chlorine or peroxide will ever be completely displaced in the bleaching of textiles. Concentrated bleaches, both chlorine and peroxide, are powerful oxidizing agents and must be handled with proper care. This incidentally is good practice with any unfamiliar material. Diluted, the bleaches are relatively harmless as witnessed by the widespread use of household chlorine bleaches such as Chlorox and hydrogen peroxide such as the well-known drug store item. Other oxidizing agents may be applied as bleaching agents, and among those sometimes found in textile use are sodium perborate, potassium permanganate, sulfur dioxide (a gas formed by burning sulfur, and employed for bleaching wool in the "stoving" process), as well as certain organic compounds of both chlorine and peroxygen.

Dyeing

Dyeing might well be considered *the* major wet processing operation, although some difference of opinion on this may be found. Certainly in the transformation of the raw fiber into the ready-to-wear garment there is likely to be no other single treatment which will so greatly influence ultimate consumer acceptance. However dyeing will be here considered only in relation to the auxiliaries em-

ployed. First, it is obvious that before dyeing in the usual sense can be possible the yarns or fabrics must be wet. This may seem to be a simple matter of "dunking" the material in the bath, but it is rather more than that. Take a small swatch of cotton cloth or a small skein of yarn in the "grey" (greige) and drop it into a container of plain tap water. Even if the water is agitated, or the material pushed under, it resists wetting and tends to float indefinitely. Add a "wetting agent" to the bath—soap solution will do—and the cotton will rapidly become wet and sink. The tension or resistance of the water to spread uniformly over and through the fibers and the resistance of the textile material to be wet by the liquid has been diminished. This inherent repulsion of the water and the fiber in relation to each other is called surface tension or interfacial tension, and wetting agents are sometimes known as surface tension depressants. Other forces also play a part and the subject tends to become complicated. Nevertheless a wetting agent can be simply and accurately considered as any substance used to increase the wetting power of a water bath with respect to textiles. The term "wetter water" is appearing in magazines and newspapers, particularly recently in connection with fire-fighting; it merely is water with a wetting agent added.

WETTING AGENTS.—Soap was mentioned as a wetting agent—there are many others which are better. These materials are commonly compared on the basis of their wetting speed, or rather on the amount required to wet out a standard 5 gram skein of cotton yarn under controlled conditions within a specified time. Some of them, similar in nature to the synthetic detergents previously discussed, have amazing wetting power, being effective in concentrations of 1/20 of one percent or even less. In actual mill practice as little as 1/100 of one percent solutions may suffice. A great many of the wetting agents have some of the familiar characteristics of soap: they foam or suds readily, they impart a slippery feel to water, they may act to some extent as detergents or cleansing agents. Since surface action or wetting is one of the elements of detergency this last is not surprising. In recent years a vast number and variety of wetting agents have appeared in the textile field, indicative both of the interest in and the importance of this aspect of wet-processing. Like the detergents, they may be natural or synthetic, pure compounds or mixtures, liquid, paste or dry, alkaline, neutral or acid, concentrated or dilute, unique or familiar. All have in common, to a greater or lesser extent, the property of accelerating the ease or speed with which textiles may be wet out or saturated in an aqueous bath.

It should be mentioned that even when the goods have just previously been scoured and so enter the dyebath already wet the wetting agents still serve a highly useful purpose. The dye liquor must displace the water carried over and this action is greatly expedited by the presence of wetting agents. If the goods are of a heavy construction, or a tight weave, uniform penetration of the color may be practically impossible without the assistance of a wetting agent. Some dyestuffs must be dispersed or pasted before being added to the dyebath, and wetting agents such as sulfonated castor oil (Turkey Red Oil) or modifications thereof may be used for this. Regardless of whether dyeing is done in a neutral, an acid, or a highly alkaline bath—or in the presence of high percentages of salts—wetting agents effective under such conditions are available.

SPECIAL PRODUCTS.—In addition to the wetting agents, several particular auxiliaries or specialties are applied in connection with dyeing. A retarding agent may be desirable so that the color is picked up slowly and uniformly for a good deep-dye job rather than a rapid surface deposition. Common glue and other proteins are such retardants; lignin extract is another. Dullers, often inorganic pigments, will reduce a too-bright luster. A brightener may improve a "saddened" shade. Fixatives, developers, and other after-treatments, gas-fading inhibitors to lessen atmospheric fading, strippers to remove dye for redyeing or for special effects, leveling agents for dyeings tending to be otherwise uneven, thickening agents used in print pastes—these are a few of the other types of assistants related to the dyeing operation.

The field of application for wetting agents is of course not limited to dyeing. They may be useful in any wet operation where rapid and uniform wetting is not otherwise easily obtained. Mercerizers' assistants are wetting agents effective in the concentrated caustic soda solutions necessary for mercerizing. At the other extreme the carbonizing of wool calls for a fairly concentrated bath of sulfuric acid—wetting agents for this are readily found. Certain operations such as flame proofing may call for saturation of heavy fabrics with concentrated solutions; wetting agents make it practical. Even when applying water-repellents to render fabrics hard-to-wet, a wetting agent may be useful in the process. Wetting agents—some of them—will render a fabric highly absorbent, so that if dried following the application of the auxiliary it is readily rewet; a most useful phenomenon for shrink proofing and for some continuous dyeing procedures.

Finishing

Notwithstanding the number and apparent complexity of the assistants used for scouring, bleaching and dyeing, it is in finishing that the textile auxiliaries are of greatest service in adding utility and value to the goods in process. The boil-off may upon occasion be a simple wash with soap and alkali, the dyeing merely a matter of uniting color and material, but in finishing the auxiliary is the essence. It is true that certain effects are achieved by mechanical means, as in calendering, embossing, decatizing and the like, yet these are relatively minor compared with the many special finishes obtained with the textile auxiliaries. Here is a list of some of the more familiar effects commonly sought and achieved: softening, stiffening, weighting and binding, crease proofing, deodorizing, water proofing, scrooping, shrink proofing, slip proofing, filling, flame proofing, splash proofing, stabilizing, moth proofing, mildew proofing. For each effect, from a few to a hundred or more auxiliaries may be applicable, many essentially similar but others differing widely. A whole volume has been written concerning the basic raw materials used in the finishing of cotton piece goods. However, as a rule any one plant may be concerned with only a few basic finishes, and all that is necessary here and now is a review of those which may be considered fundamental.

SOFTENERS.—In the routine operation of dyehouse and bleachery the goods in process are subject to many baths and to numerous rinses. As a consequence much of the waxy or oily substances normally present on natural yarns, as well as the oils and lubricants applied to the man-made yarns, are removed. In the course of this the fabric may be rendered harsh or stiff. Softeners therefore are applied, to restore or renew some of the original feel or "hand", perhaps to improve upon the original. Most of the softeners are based on natural or synthetic fats, oils and waxes. Sulfonated oils are typical softeners, so are many emulsions or dispersions of oils and fats with a soap or sulfonate base. In general, softeners add a certain slip or "lubricity" to the fibers so that in relation to each other they can move more readily and the yarns in turn can bend or distort easily. Other factors have a part but the net result is to give to the material a soft feel to the touch—or what is called a good hand. The effect is pleasant and agreeable; a harsh fabric may induce opposite impressions. With

some softeners the finish is temporary, lost in the first or second washing; with others it is more durable due to a bond or attraction between the material and the substance of the auxiliary. Softeners may be liquid, paste or solid, acid, alkaline or neutral, and may vary greatly in make-up as well as in physical appearance—yet it is safe to say that the typical product of this group is a soluble, solubilized, emulsified or dispersed fatty compound. High titer or hard fats (those which are solid rather than liquid at room temperatures, due to high melting points) are most often employed in their formulation. Because softeners are put on in the last bath before final drying, and left in the goods indefinitely, it is most important that they be stable and free from the hazard of becoming discolored, rancid, or odorous. The hard fats most nearly meet such requirements, and in addition give a generally better hand. Incidentally the nature of softeners is such that the luster of the material processed is often increased while the hand is improved. Since softness or hand is a matter of individual preference, and differences are often slight, choice of a softener is frequently a difficult matter. Experienced finishers however can make remarkably consistent evaluations. Generally speaking it is only with experience that high skill in that art can be achieved.

SIZING AND FILLING.—Often it is desirable to add body or crispness to fabrics—an extreme case would be stiff collars or boiled-front shirts. This is done in the same manner as in the home, with starches and starch derivatives. Synthetic resins and plastics in emulsion or solution form are also coming into play, to give relatively permanent effects. When added weight or filling is desirable, clays or talc and sometimes soluble salts are added—a familiar example of this is back-filling, where the thick finishing mix is applied to one side—the back—of the fabric. Added binders or adhesives may be necessary when a heavy backfill mix is used. Some of these finishes may yield a high luster, especially if waxes or waxy compounds are added; these latter also serve to soften or plasticize a very stiff mix. If a dull or delustered appearance is wanted certain finely ground or dispersed pigments may be necessary. The fine particles break the smooth surface of yarns in the same manner that a highly polished surface is dulled by roughening. Sizing or filling is often essential with very light or sheer fabrics to facilitate handling or cutting; the appearance and utility of the material is improved, while the size can be readily removed by washing when it has served the end in view.

PROOFING.—A great many finishing operations are included in the term proofing, some of them such as shrink proofing accounting for millions of yards of goods, with others such as mildew proofing or flame proofing being limited in volume and scope. Although shrink proofing of cotton fabrics is essentially a mechanical operation it is greatly aided by certain auxiliaries known as rewetting agents. For this process it is highly desirable that the fabric be absorbent so as to readily take up moisture from a spray. Rewetting agents applied to the fabric and dried give the necessary absorbency; many of them at the same time improve the hand and appearance of the cloth. On rayons and woolens shrink proofing is often achieved with synthetic resins. The resins are applied in a soluble or pre-condensed form but are made insoluble and "set" by subsequent drying and heating. The shape and the dimensions of the fabric are "stabilized" by the bonding action of the resins. Various chlorination treatments are given to wool to make it shrink resistant and washable, some of them employing under controlled conditions the same sort of hypochlorite used in cotton bleaching. During the war many hundreds of thousands of pairs of woolen hosiery were so processed for the armed forces.

SYNTHETIC RESINS OR PLASTICS.—Resins are used in large quantities for crush proofing or crease proofing rayons and cottons. These fibers do not have the resistance to wrinkling which is inherent in wool and crush proofing adds greatly to their utility and value. Another field wherein the synthetic resins or plastics are important is in the production of non-woven fabrics. Here spinning and weaving are by-passed; a fine web of the fibers is made and bonded by the application of resins with heat and pressure. Such fabrics have specialized uses, as in making laminates or sandwiches of fabric and plastic; they are however rapidly finding other spheres of usefulness and show promise of becoming a major textile item. They bridge a gap between textiles and paper, possessing many of the good features of each. A good example of a non-woven fabric is the material used in making tea bags—even in boiling water no weakening or distortion occurs. The process of making these bonded materials may be wet or dry; the resins may be applied as water emulsions or as solvent solutions. This is true of many of the resin applications. In the production of coated fabrics such as artificial leathers, certain suedes, industrial cloths, some rainwear and the like, the dry applications are predominant. These coatings are generally of an impervious nature, with a continuous film of resin present, and the material so processed may be said to belong to a special branch of the textile industry, beyond the scope of this review. The *wet* processed fabrics with few exceptions are porous and pass air freely—a major factor of comfort for the wearer.

MILDEW PROOFING AND MOTH PROOFING.—Cottons are prone to attack by mildew, woolens by moths. By rendering the material unattractive or unpalatable to the mildew organisms and to the moth larvae respectively, both may be protected. Mildew proofing of cotton textiles was of tremendous importance during the war because of the service requirements in the humid jungle areas of the Pacific. Compounds of copper, mercury, and other metals which inhibit or completely prevent the growth of mildew organisms were tremendously important. Peacetime requirements of this nature are relatively small, but are steady. Moth proofing of wool of a relatively permanent nature is possible with certain complex organic compounds similar in many respects to dyestuffs in application and retention. Inorganic fluorides or fluosilicates are extensively used for temporary, renewable protection.

WATER REPELLENTS. — Protection from rain is an age-old need, and treatment of textiles to render them water proof or water repellent is a common practice. Early rainwear was largely dependent for its effectiveness upon a coating which made the material impervious to air as well as water. Such fabrics, oilskins for instance, are effective barriers to moisture but tend to be stiff, uncomfortable, and often tacky. Water repellents as applied nowadays do not noticeably lessen the porosity of a garment; air gets through readily and the wearer is far more comfortable. Yet water does not penetrate because of a fine deposition of hydrophobic (water-repelling) matter such as waxes and aluminum salts. This type of water repellent treatment is not permanent and the effect is lost after several washings, but the mill application is simple and the repellency can be easily restored in the laundry or in the home. A single padding or impregnation followed by drying in standard equipment suffices. Besides their use on rainwear, such water repellents are applied to sport jackets, snow suitings, lumberjackets, and such; as well as to women's hosiery where the treatment is known as splash proofing. Several water repellents are available which give practically permanent effects. While they are more complex and expensive to apply, and may call for equipment not always available, they do have the advantage of withstanding washing and dry cleaning.

FIRE RETARDANTS.—Textiles are organic in substance and all of them may be destroyed by fire but they vary greatly in their resistance to flaming. Wool and silk burn slowly and even very sheer or napped materials made of these fibers do not present a serious hazard. On the other hand very light or napped or tufted cottons and rayons may burn readily, or be subject to flash flaming. Hence there is a continuing interest in flame proofing agents for cellulose fabrics. A tremendous amount of work has been done, and highly successful flame proofing can be achieved with water-soluble compounds. Since however, these are readily removed in washing, their use is limited. In the war years a very durable finish was developed which provided protection against flaming, mildew and water; it has considerable utility but the material so processed due to color, stiffness and other factors is rendered unsuited for general garment wear. As of this writing there is still no completely satisfactory *permanent* flame proofing treatment for garment fabrics.

Since textiles as such cannot be made wholly proof against fire or water, the terms fire proof and flame proof are regarded with some disfavor in the industry. Auxiliaries for these applications are commonly known as fire retardants and water repellents. Similarly, with softeners and other finishes having good washfastness, unless absolute permanence is assured the finish is described not as permanent but as durable. This may be regarded as part of the present healthy and proper concern for factual labelling of textile materials in general.

Conclusion

This review of textile auxiliaries and their relation to wet-processing is primarily an outline of the subject. It is not, and cannot be, complete. Procedure and practice vary from mill to mill, although underlying principles remain the same. A general discussion is certain to pass over much that is of prime importance in any one establishment. Hence the omission of any process or of any type of product is due either to accident or to the limitations of space and subject and can have no bearing upon the relative importance of either. Mention of trade-names has been intentionally avoided. As previously noted, the *Year Book* of the AATCC contains a comprehensive listing of Textile Chemical Specialties complete with trade-names, applications, and some information as to compositions. This should be consulted in connection with any consideration of the auxiliaries. As a matter of fact the *Year Book* may well be considered one of the essential textbooks in a course of training in wet processing.

It is felt that the arrangement which has been used here provides a natural and preferred order of study for the subject. Although intended for beginners a broad review such as this may be confusing, particularly to the newcomer in the industry. When through practical mill experience the text matter becomes more familiar an occasional re-reading may therefore be helpful. Much of what has been written is intended to raise questions rather than to answer them. The fleeting mention of such interesting and important items as desizing agents, synthetic detergents, rewetting agents, durable finishes, and others should assuredly provoke some rewarding classroom discussion. The whole field of the wet-processing of textiles is a captivating study—if the small segment of it considered here does not so appear the fault lies not in the subject but in the presentation. When sincere interest and a desire for knowledge provide the necessary motivation, the earnest seeker of information can nearly always find it. In vocational education lies the means of stimulating the essential interest and of developing the essential desire.

—◆ ◆—

Report, PTI Student Chapter

AT a meeting of the Philadelphia Textile Institute Student Chapter on October 28, 1948, Richard G. Mansfield was elected Chairman; Thomas R. Scanlon, Jr., Vice-Chairman; and Doris Mae McAllister, Secretary. A film from Botany Mills, Passaic, N. J., was shown.

Respectfully submitted,
DORIS MAE McALLISTER
Secretary

—◆ ◆—

Report, LTI Student Chapter

THE regular monthly meeting of the Lowell Textile Institute Student Chapter was held on November 3, 1948.

Prof. Ernest James was elected faculty advisor, and Joseph Masachi, associate advisor.

A seminar meeting was held on October 28. John J. McDonald of the Textile Chemistry Department, Lowell Textile Institute, spoke on "The Laboratory Functions of Quality Control."

Future seminar programs were announced as follows:

November 18: Harold P. Anderson of the Abbott Worsted Company will speak on "Wage Incentives in the Textile Industry."

December 16: Dr. Weber of the Department of Agriculture will speak on "Biological Degradation."

Respectfully submitted,
JOAN L. GREGG
Secretary

Notice to Secretaries of Local Sections

Send Notices of Future Meetings to the American Dyestuff Reporter at the Earliest Possible Date

TRADE NOTES • NEW PRODUCTS

• New England Textile Foundation

At the first fall meeting of the Executive Committee after the termination of its Second Fund Raising Campaign, the New England Textile Foundation donated funds totalling $245,157.58 to be used for the benefit of the four textile schools in New England. These funds are being distributed as follows:—

To Bradford Durfee Technical Institute, Fall River, Mass.

For equipment	$12,000.00
For faculty aid	4,000.00
For scholarships (2)	1,000.00
	$17,000.00

To Lowell Textile Institute, Lowell, Mass.

For equipment	$99,984.00
For faculty aid	12,720.00
For scholarships (40)	20,000.00
	$132,704.00

To New Bedford Textile Institute, New Bedford, Mass.

For equipment	$11,400.00
For faculty aid	8,820.00
For scholarships (3)	1,500.00
	$21,720.00

To Textile School of R. I. School of Design, Providence, R. I.

For equipment	$50,233.58
For faculty aid	14,000.00
For scholarships (17)	8,500.00
	$72,733.58

The above gifts are in addition to more than $126,000.00 given to the New England textile schools during the previous year.

• Purchase of Rumford Concluded

Conclusion of the purchase by Heyden Chemical Corporation, New York, of the assets of Rumford Chemical Works, near Providence, R. I., was announced recently by B. R. Armour, president of Heyden, and A. E. Marshall, president of Rumford.

All of the assets of Rumford were acquired by Heyden in exchange for 99,438 shares of Heyden common stock and the assumption of outstanding liabilities. The stock will be distributed pro rata among Rumford holders.

The 94-year-old Rumford Company manufactures grocery products, including the well-known brand of Rumford baking powder and industrial chemicals. Heyden is a leading manufacturer of industrial chemicals, antibiotics and pharmaceuticals.

The new addition will be operated as the Rumford Division of Heyden and the grocery products it makes will be marketed by a selling company, a Heyden subsidiary, to be called the Rumford Company. Its chemical products will be merchandised through the regular Heyden sales organization, it was said.

The Rumford Division will be directed by Mr. Marshall, who has been named a vice president of Heyden, and he will also head the sales company.

Rumford is the sixth major acquisition by Heyden in the last three years, Mr. Armour pointed out. Previously it has purchased plants in Princeton, N. J., and Memphis, Tenn., a pharmaceutical manufacturing company and a pharmaceutical distribution company in Detroit, the American Plastics Corporation in Bainbridge, N. Y., and an important interest in American Potash & Chemical Corp., Trona, Calif., leading West Coast producer of potash and similar products.

• To Receive Nobel Prize

Dr. Paul Herman Müller (above) will receive the Nobel Prize for 1948 in Physiology and Medicine as a result of his work in the Geigy research Laboratories on DDT Insecticides. He will receive the prize on December 10th.

Dr. Müller is a native of Switzerland, and was educated at Teachers College and did considerable post graduate work and lecturing there, receiving his Ph. D. in 1925. He entered the firm of J. R. Geigy S.A., Basle, in May, 1925 and worked on developing synthetic tanning substances which led to the production of a number of synthetic tanning agents. Research in disinfectants followed and in 1935 he began working on the problem of synthetic insecticides in the course of which he synthesized many compounds, resulting ultimately in DDT. The first United States production of DDT was started in early 1943 at the Cincinnati Chemical Works, Norwood, Ohio, an affiliate of Geigy. In mid-1945 Dr. Müller and his associates were flown from Europe by army transport to lecture before the National Research Council and other scientific organizations of the government on his discovery and various scientific phases developing out of the great amount of research work which had been done on the substances.

• Nopco Appointment

Effective January 1, William A. McCready will become a member of the Central Area sales force for the Industrial Division of Nopco Chemical Company, according to a recent company announcement.

Prior to this appointment, Mr. McCready spent several years in the company's laboratories at Harrison, New Jersey, specializing on product application and customer service problems.

In preparation for his work in the chemical field, Mr. McCready studied at Stephens Institute of Technology and Brown University, supplementing this with courses at Rutgers University and Seton Hall College.

Mr. McCready's sales territory will include Indiana and sections of Ohio and Kentucky where he will work directly under John N. Gammon, district manager. In addition to sales on the processing chemical line of Nopco, he will handle the metallic soap products of Metasap Chemical Company, a wholly owned subsidiary.

• Custom House Guide

The 86th edition of the Custom House Guide is now off the press, according to a statement made recently by John F. Budd, editor and publisher.

Larger than ever before in its history of more than 8½ decades, the latest edition of the Guide is said to be the only publication in the world including the new United States import duties as provided in the General Agreement on Tariffs and Trade (Geneva), these rates appearing against each of the more than 30,000 commodities in the Alphabetical Index. The official phrasing of the General Agreement

appears under each paragraph affected in the section devoted to the Tariff Act of 1930. This is in addition to all President's Proclamations and changes by Acts of Congress.

The more than 1,600 pages of the Guide, which actually comprise seven volumes in one, feature in addition to the above, the Internal Revenue Code; Port activities, facilities, charges, and a directory for shippers and those in allied trades; special sections devoted to Canada and the Philippines; a General Information Section containing considerable valuable information for importers and exporters; and the United States Customs Regulations complete and revised to date.

To keep the Custom House Guide up-to-date, Mr. Budd publishes a monthly supplement, American Import & Export Bulletin, which covers the latest laws, regulations, decisions, rulings, import and export control requirements, trade agreements, general news, and business contact lists. In addition, a free Readers' Information Service for the benefit of subscribers is maintained.

The Guide may be obtained from Custom House Guide, Box 7, Sta. P., Custom House, New York 4, N. Y., for $25.00, plus postage. (Includes monthly Bulletin.)

• Building Rayon Spinning Machines

H. W. Butterworth & Sons Company, of Philadelphia, Pa., is building 60 rayon spinning machines for a new plant of Beaunit Mills, Inc., at Childersburg, Ala. Each Butterworth machine will have 128 spinning positions and will be equipped with a Butterworth patented traverse drive system. The new Beaunit plant in which the machines will be installed is scheduled to have an annual capacity of ten million pounds of viscose filament. It is expected to be in operation by January 1, 1949.

• Fiberglas Scholarships Established

To assist students who give promise of being able to make important contributions to the progress of the textile industry, and to stimulate interest in the development of new applications of Fiberglas textiles, Owens-Corning Fiberglas Corporation has established scholarships at three of the nation's leading textile schools.

The scholarship at each school provides full tuition and $500.00 for expenses during each of the last two (junior and senior) years of the four-year courses offered by the schools. The schools are Lowell Textile Institute, Lowell, Mass.; Philadelphia Textile Institute, Philadelphia, Pa.; and School of Textiles, North Carolina State College, Raleigh, North Carolina.

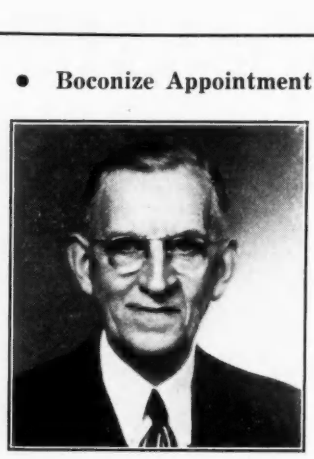
Awards of the scholarships will be made by the regularly constituted scholarship committees of the schools, on the basis of the candidate's marks, character, qualities of leadership and need. Successful candidates must maintain standards set by the schools. The first Fiberglas scholarships will be awarded this fall. Hereafter, awards will be made before the end of the sophomore year.

Recipients of the scholarships will be offered an opportunity to work in the Fiberglas textile plants at Ashton, R. I., and Huntingdon, Pa., during the summer months. Members of the faculties of the schools will be invited to visit the plants and see the processes employed in the production of Fiberglas yarns. Members of the Fiberglas Corporation's textile division will be available as guest lecturers at the schools.

Since the end of the war, applications of Fiberglas textiles have rapidly expanded in the industrial field. Development of processes for coating the fabrics with resins and synthetic rubbers have led to a variety of new uses including awnings and canopies for commercial buildings, hotels, theatres, etc.; window shades for use in public conveyances; covers for seats in public conveyances and for furniture in offices, hotels and institutions. Use of Fiberglas textiles as a base for electrical insulations was well established before the war, and these electrical applications continue to show steady growth.

The new Coronizing treatment for Fiberglas fabrics is said to forecast early entry of the fabrics into the consumer-decorative field. The process relaxes the yarns under a series of intense heat treatments, puts a "weave set" in them and eliminates the stiff appearance that had limited their decorative applications largely to places of public assembly where the fire-safety provided by the noncombustibility of the fabrics was of great importance.

• Boconize Appointment



H. J. McAteer (above), formerly head of the McAteer Woolen and Worsted Company, has been appointed sales manager of the Boconize Sales Corporation. The president of Bocon Chemical Corporation, Ernest J. Conway, announced the formation of this sales corporation which is designed to sell Boconize mothproofing compound to men's wear manufacturers on a national scale.

The Bocon Chemical Corporation, together with its subsidiary, has taken new offices at 45 East 17th Street, New York 3, New York.

• Brown Instrument Catalogs

Brown Instrument Company, a division of Minneapolis-Honeywell Regulator Company, Wayne & Roberts Avenues, Philadelphia 44, Pa., has recently published two new catalogs as follows:

pH and Conductivity — This catalog offers a discussion of the fundamentals of pH, oxidation-reduction potential and conductivity and describes various instruments and accessories. It is illustrated with photographs and schematic drawings and includes a partial list of circular and strip charts and scales and dimensional diagrams of pH equipment. Application to various industrial processes is featured. *Catalog No. 15-12.*

Pressure and Vacuum Gauges — Complete descriptions of various instruments are given in this catalog. It is well illustrated with schematic drawings, photographs and diagrams and also includes pressure range charts and indicating scales. *Catalog No. 7000.*

Copies of the catalogs are available upon request.

• Nylon Stripping

It is claimed that nylon stripping with almost complete dye removal may now be accomplished essentially without damage to the nylon fiber through the use of Textone, a sodium chlorite product, according to Mathieson Chemical Corporation. The new process may also be used for partial stripping. In either case, it is claimed, the chlorite exhibits its characteristic ability to attack color bodies with a minimum degradation of the fiber.

The procedure uses ordinary processing equipment, is faster, and gives more uniform results than other stripping methods, it is reported. For partial stripping, the goods are treated in a bath containing sodium chlorite and detergent, to which formic acid is added. After a total of 30 minutes in the stripping bath, the goods are rinsed and are then ready for redyeing.

For complete stripping the goods are first treated in a bath containing acetic

acid and synthetic detergent, to which zinc formaldehyde sulfoxylate is added. After rinsing, the goods are stripped in a sodium chlorite bath.

Sodium chlorite has been in use for several years as a stripping agent for other textiles. Its introduction to the nylon field, according to Mathieson, promises to the nylon dyer an easy and safe solution to the problem of reprocessing off-shade dyeings.

• ASME Textile Meeting

The twenty-seventh annual meeting of the American Society of Mechanical Engineers' textile division will be held December 3 at the Hotel Pennsylvania in New York City, it is announced by Arthur B. Studley, sales executive of SKF Industries, Inc.

The 600-member division, of which Studley has been chairman since 1947, conducts studies of vital problems in the textile field and disseminates information in reports to both members and the industry at large.

The year's one-day program, Studley said, will be devoted to the presentation of seven papers. Those who will appear before the meeting, and the subjects they will discuss, are: Myron Curtis, director of engineering, Warner & Swasey, weaving machine developments; Dr. Raymond B. Seymour and George Schroder, present status of bonded fabrics; Kenneth Fox, president, Lowell Textile Institute, textile education; Harold Hindman, president, Instron Engineering Corp., Instron tensile tester; Fred D. Snyder, Westinghouse Electric & Manufacturing Co., electromechanics in the textile industry; Victor Sepavich, Crompton & Knowles Works, strain gauge as applied to loom study; R. L. Lincoln, Westinghouse Electric & Manufacturing Co., electrostatic air cleaning in the textile industry.

• Hercules Appointments

Dr. Peter Van Wyck, manager of the Virginia Cellulose Division of the Hercules Powder Company Experiment Station, has been appointed technical assistant to the Hercules director of research, the company announced recently. He will work on process development.

Dr. Richard E. Chaddock, who has been handling technical assistance in this field, now will take over responsibility for technical assistance on sales development. He will serve as liaison between the sales development section of the department and the sales research division.

Dr. Arthur F. Martin will replace Dr. Van Wyck as manager of the Virginia Cellulose Division at the Experiment Station. He has served as chief chemist at the Virginia Cellulose plant in Hopewell, Va., for the past four years.

E. L. Jones, operating supervisor at the Hopewell plant, succeeds Dr. Martin as chief chemist of the plant.

• General Aniline Appointment

Dr. William L. Walsh (above) has been appointed Manager of the Rensselaer, N. Y., plant of General Aniline & Film Corporation, it was announced recently by Chandler T. White, General Manager of the Company's General Aniline Works (dyestuffs) Division. The plant, started in 1868, is said to be the oldest dye-making establishment in the United States. Another similar plant is operated at Grasselli, N. J.

Dr. Walsh had been Production Manager at Rensselaer since 1942 and helped set the pattern for many improved production methods used there today. He started at the plant in 1936 as a research chemist and thereafter directed the manufacture of azoic colors.

Born in Somerville, Mass., Dr. Walsh attended Boston College High School and graduated from Boston College in 1931. Graduate work at M. I. T. led to the degrees of M.S. in 1933, and Ph.D. in 1936. In the interim, he worked part time as a research chemist in the M. I. T. Division of Industrial Corporation and Research. He is a member of the Hudson Valley Chapter of the Society for Advancement of Management, American Chemical Society, Society of Chemical Industry and Sigma Xi.

• Drimeter

A new electronic instrument for measuring the moisture content of any type of fiber or mixture of fibers is now being introduced in this country, following its successful introduction in English textile mills two years ago. Called the Drimeter, this instrument is said to provide a continuous indication of moisture content and is accurate within a plus or minus of 1 per cent, according to Ralph V. Coles, vice-president of Fielden Electronics Inc., an affiliate of Fielden (Electronics) Ltd., Manchester, England. It is stated that eight of the nine English textile machinery manufacturers who make drying machines or slashers have standardized on the use of the Drimeter.

The Drimeter is based on the principle that the capacitance of a two-plate condenser will vary with the amount of moisture carried by fabric or yarn passing between the plates. The greater the amount of moisture, the greater the capacitance of the condenser; the lower the moisture content, the lower the capacitance. By continuously measuring the capacitance of the condenser, the Drimeter continuously measures the moisture content.

The Drimeter consists of two basic parts. One is the electronic hygrometer unit which shows the moisture content of the yarn of fabric instantaneously and continuously on the meter on the instrument panel. The other part is the condenser consisting of a mounting arm and two plates between which the yarn or fabric passes. The condenser and the hygrometer unit are connected by two cables.

The condenser is bolted to the frame of the dryer or slasher in such a position that the fabric or the warp sheet passes between the plates as it passes from the slasher or dryer. The electronic hygrometer unit is placed at a convenient location near the condenser. A duplicate meter is available for remote indication.

An automatic control mechanism is available which is connected to the Drimeter and to the speed changing mechanism of the drying machine. The automatic control varies the speed of the machine in accordance with the moisture content of the fabric as measured by the Drimeter.

Like the Drimeter, the automatic control operates electronically. Two variables are fed to the automatic control. They are: 1) a voltage derived from the Drimeter which varies according to moisture content; and 2) a voltage proportional to the drying machine speed. The voltage proportional to machine speed is deprived from a small alternator connected by a belt to a moving shaft on the dryer. Automatic control can be installed at the same time as the Drimeter or can be added later.

The automatic control unit applies a correction to the speed of the drying machine or slasher proportional to the deviation from the desired moisture content, but changes in machine speed are not instantaneous. Momentary wet patches do not activate the control mechanism unless they are of a two or three second duration;

thus damp seams, while registering on the Drimeter, have no effect on the automatic control.

American mills which have Drimeters in operation report the following advantages, according to Mr. Coles:

1—An average increase of 20 to 30 per cent in the production of drying machines or slashers as over-drying is said to be eliminated. One New Jersey mill reports saving 32-machine hours a day.

2—A noticeable improvement in the quality of fabrics. It is stated that the Drimeter permits any fabric or yarn to be dried to its normal moisture content, or any other content desired, and enables that content to be maintained accurately within a plus or minus 1 per cent. This permits standardization of all finishes.

3—Operating costs are said to be lower as drying machines operate more efficiently. It is common practice to run drying machines too slowly and to use excessive heat. Fabrics more frequently than not are run bone-dry. Drying only to normal moisture content saves fuel and power as well as machine-hours.

4—In warp sizing, accurate moisture control also is said to increase production, lower operating costs, and improve quality. In addition, it is said to assure maximum weaving efficiency and prevent mildew.

In addition to the automatic control and the meter for remote indication, a calibration unit and a strip type recorder are available.

The Drimeter is guaranteed for six months. Fielden Electronics Inc. is located at 1171 New York Avenue, Huntington Station, Long Island, New York.

Ralph V. Coles, right, vice-president and active head of Fielden Electronics, Inc., demonstrates the sensitivity of the Drimeter by moistening a handkerchief and passing it between the electrodes of the condenser.

• New Taber Abrasion Tester

Model No. 100-109 a new Abrasion Testing Set in the Taber line of standard rub-wear abrasion testers incorporating their unique rotary abrading action on a 4 in. specimen, has been announced by the Taber Instrument Corp., 111 Goundry St., North Tonawanda, N. Y. The wear results from alternately rubbing the flat faces of two resilient Calibrase wheels over the surface being tested. A range of standardized abrasive wheels are available for testing all types of surface finishes, including electroplate, porcelain enamel, organic coatings, leather, glass, plastics and woven textile fabrics. This new tester is said to be the result of 12 years experience in building various types of abrasion testing equipment.

An important feature of the new testing set is that the control unit is equipped for dual operation, that is, an additional Abraser unit can be located beside and connected with the control unit thereby permitting two specimens to be tested simultaneously using the same controls and vacuum unit.

Three testing sets are offered by the manufacturer, each complete with parts and supplies for various types of testing.

An illustrated brochure containing important technical data and full description of Taber's unique rotary abrading action is available by sending your request to the manufacturer, Dept. A.D.R.

Taber Abrasion Tester

• Completes 50 Years of Service With Geigy

Richard L. Quinn, manager of the Philadelphia office of Geigy Company, Inc. (New York), completed 50 years of service with this Geigy affiliate in October 1948. On September 11, 1948 at the third annual outing of the New York affiliate, Mr. Quinn, along with 30 others, became a charter member of the "Geigy Quarter Century Club (America)."

Born May 18, 1885 in Philadelphia, Mr. Quinn attended grammar school and two years of high school before joining the Geigy Organization as laboratory and office boy. During his employment with the company he attended the Philadelphia Textile Institute for three years on a cooperative arrangement, studying chemistry and dyeing under the late well-known educator, J. Merritt Matthews. Mr. Quinn in 1906 became a salesman and in 1918 succeeded William Sesso (formerly Secretary of the company) as Philadelphia manager, which position he still occupies.

Mr. Quinn, until a few years ago, was district senior sculling champion and was well known throughout the East for his oarsmanship. He is well known as a hunter and marksman, in which sport he still participates enthusiastically.

In 1914 Mr. Quinn made his first flight in an airplane, which experience remained in his blood so that in 1928 he was granted his private pilot's license.

Many of his business trips to outlying communities were accomplished by airplane, particularly on emergency problems. This activity was interrupted by the war when Mr. Quinn turned his plane over to the U. S. Government for the now famous Civilian Air Patrol, which unit lost a very high percentage of its personnel in the effort to stop the sinkings of U. S. shipping in the Atlantic. Mr. Quinn volunteered for this service but was rejected solely because of his age—certainly not on his virility, for he still retains the vigor of youth and the athletic build of an Adonis.

Mr. Quinn has been a director in several business organizations and clubs, most of which activity he has seen fit to drop.

He presently is one of the three Trustees of the Profit Sharing Retirement Plan of the American affiliate, and on Septem-

ber 11, 1948 was elected the first President of the "Geigy Quarter Century Club (America)."

A testimonial dinner was given to Mr. Quinn at the Manhattan Club, New York City on October 15th at which time he was presented with a diamond studded pin of the Geigy Quarter Century Club (America), as well as a resolution indicating the establishment of the Richard L. Quinn Scholarship at his Alma Mater.

Richard L. Quinn

• General Releases

General Dyestuff Corp., 435 Hudson Street, New York 14, N. Y., announces release of circulars describing the following products:

Igepal CA Extra*—an entirely synthetic detergent, wetting, dispersing and emulsifying agent which is said to be characterized by its high efficiency and universal applicability. It is a polymerized ethylene oxide condensation product and can be classified chemically as an alkylaryl poly glycol ether. It is stated that it cannot form insoluble soaps with lime, magnesium, iron or other metals. It is a tan liquid readily soluble in water. It can also be supplied in anhydrous form in 100 per cent active ingredient content under the name of Igepal CA Extra High Conc. *Circular G-354-1.*

Rapidogen Black Brown IT*—a stable azoic compound soluble in alkali, which after printing and drying, develops in acid ageing to form an insoluble pigment. It produces on cotton and rayon a desirable black brown shade said to possess very good fastness to light and good all round fastness properties. It is stated that it is also fast to caustic overprinting, which is used to produce plissé effects. It dissolves readily in caustic soda and is said to have good stability in the print paste. An addition of neutral chromate to the print paste is recommended. *Circular G-529*

Fast Light Orange GA Conc. CF—a very level dyeing acid dyestuff said to possess very good to excellent fastness to light. It produces yellowish shades of orange. It is stated that in addition to its levelling property and light fastness, it possesses good fastness to hot pressing, crocking, alkali, carbonizing, decatizing and stoving. It is recommended by the manufacturers for the dyeing of combination shades, especially mode shades, on yarn and piece goods together with other level dyeing, light fast dyes, such as Fast Light Yellow 3GX-CF, Fast Light Red BA-CF, Alizarine Rubinols and Alizarine Blues, when no fastness to washing or milling is required. It is supplied in a nondusting form and is suitable for material to be rubberized. It can be discharged white and leaves cotton, viscose or acetate effects white. Silk effects are stained relatively little. *Circular G-536.*

Alizarine Yellow R-CF—a mordant dyestuff which produces very reddish shades of yellow and is said to have unusually high tinctorial strength. It can be dyed by all chrome dyeing methods. It is stated that it has satisfactory fastness to processing and wear and is applicable to raw stock, slubbing, yarn and piece goods. It has good solubility, levels well and can be applied in all types of dyeing machines. It is said to be excellent as a yellow or orange component for the production of many shades, especially browns and olives, in combination with Acid Anthracene Brown RHA Extra New, Diamond Red ECB Extra Conc., Alizarine Blue Black BA Extra, Diamond Blue Black RBA High Conc. CF, Diamond Blue Black RZF Supra Special, etc. *Circular G-539*

Para Orange 3R-CF — a new homogeneous Para color which produces bright reddish shades of orange on cotton, rayon and other vegetable fibers when coupled with Nitrazol CF Conc. It is stated that it possesses moderate to fairly good fastness to washing on both cotton and rayon, light fastness is poor to moderate on cotton and moderate on rayon. Aftertreatments with resin finishes for anti-crease effects do not affect the light fastness. At the boil it exhausts rapidly and at 150° F. it exhausts slowly in the presence of salt and levels only moderately well once it has drawn on to the fiber. Acetate effects are stained distinctly and animal fibers and nylon are stained heavily. It is suiable for covering dead cotton. It is sufficiently free from copper and manganese to be used for material to be rubberized. It is nondusting and is soluble at the rate of 2 ounces per gallon at 120° F. *Circular G-541.*

Fastusol Orange L7GL-CF*—a new homogeneous direct dyestuff which is suitable for the dyeing of cotton, rayon and other cellulosic fibers. It produces fairly bright shades of orange which are said to possess very good fastness to light on cotton and rayon when exposed either in the Fadeometer or in sunlight. It shows very good affinity at the boil and good affinity at 150° F. It exhausts at a medium to rapid rate at both 150° F. and the boil and levels fairly well once it has drawn on to the fiber. It dyes wool considerably lighter than cotton or rayon and on such union material very good uniformity is obtained at the boil. At 150° F. the animal fiber is left nearly undyed. Acetate rayon effects are left clean. It is non-dusting and is sufficiently free from copper and manganese to be used for dyeing material which is to be rubberized. It can be applied in all types of dyeing equipment and having solubility of 8 ounces per gallon is said to be particularly well suited for package dyeing. Dyeings are dischargeable to a white. *Circular G-542.*

Fastusol Blue L5GA*—a new homogeneous direct dyestuff which produces bright shades of greenish blue when applied to cotton, rayon and other cellulosic fibers. It is stated that it possesses very good fastness to light on cotton and excellent fastness to light on rayon. Aftertreatment with an anti-crease finish decreases the light fastness appreciably. The aftertreated dyeings, however, still show very good fastness to light, so the product is suitable for dyeing rayons where such a finish is required and where best obtainable light fastness is to be maintained. The fastness to washing is moderate on cotton and fairly good on rayon. It shows good affinity both at the boil and at 150° F. It exhausts at a rapid rate at the boil and at a slow to medium rate at the lower temperature and it levels well when drawing on to the fiber. Acetate rayon effects are left clean and animal fibers and nylon are stained distinctly. It is nondusting and can be applied in all types of dyeing equipment. Solubility of 5 ounces per gallon is said to make it particularly well suited for package dyeing. Dyeings are dischargeable to a white. *Circular G-543.*

* Reg. U. S. Pat. Off.

• Hooker Re-elected Board Member

H. M. Hooker, Chairman of the Board, Hooker Electrochemical Company, was re-elected a Board Member of the National Industrial Conference Board for the forthcoming year at the Board's 299th Regular Meeting held October 21, 1948 at the Waldorf-Astoria Hotel in New York.

Mr. Hooker has been active in the work of The Conference Board for many years. He was first elected a Board Member in 1938.

The Conference Board, founded in 1916, is an independent and non-profit institu-

tion for research and education in the fields of economics and business. The work of the Board is supported by nearly 3,000 business concerns, trade associations, labor unions, government bureaus, libraries, colleges and universities.

• PTI Alumni Fall Dinner

Over 150 alumni and guests associated with the textile industry attended the Annual Fall Dinner of the Philadelphia Textile Institute Alumni Club of New York held at the Della Robbia Room, Hotel Vanderbilt, Thursday, November 4th.

Following the dinner service, Leon P. Brick, vice-president of the Onyx Oil & Chemical Company and president of the P.T.I. Alumni Club of N. Y., extended a note of greeting to the gathering and introduced William L. O'Donovan, of the Celanese Corporation of America, as the Master of Ceremonies.

Mr. O'Donovan in turn introduced from among the head table guests Richard S. Cox, Dean, Philadelphia Textile Institute, M. C. Edwards, vice-president, J. P. Stevens Co., Inc., Merwin R. Haskel, president, Cohn-Hall-Marx Company, Robert L. Huffines, Jr., president, Burlington Mills Corp. (N. Y.), Henry N. Neubert, vice-president, Deering Milliken & Co., and Emil R. Pohlers, executive director, The P.T.I. Foundation, pointing out that Messrs. Edwards, Haskel, and Huffines were heading up divisions of the P.T.I. Foundation's Appeal to the industry this Fall.

Bertrand W. Hayward, director, P.T.I., was then introduced by Mr. O'Donovan and spoke briefly, giving a report on the Philadelphia Textile Institute, its top flight collegiate status, and citing the many universities and colleges with which its present faculty have been associated. He further named an impressive list of outstanding textile corporations with which many of these faculty members had been associated. Mr. Hayward presented interesting figures of the make-up of the present P.T.I. student body, showing representation from 12 states in the Union, and nine foreign countries.

He added that a very considerable number of students in the entering class had previously attended representative colleges throughout the country. Mr. Hayward went on to outline the organization of the School today, with its many faculty committees to promote and advance all phases of the students' academic and social life.

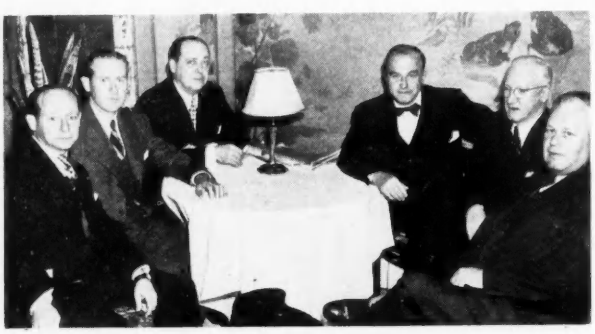
Master of Ceremonies O'Donovan then introduced the principal speaker of the evening, Charles W. Carvin, of the company of that name, National Chairman of the P.T.I. Development Fund. Mr. Carvin enlarged on the vital necessity of sound textile education to the prosperity of the textile industry and pointed out that the aims of the Foundation and the needs of the Philadelphia Textile Institute represented a relatively minute sum when compared with the tens and even hundreds of millions of dollars being raised by others for similar purposes. Citing the textile industry as the largest employer of man power in the Nation, he made reference to the companies represented by several of the guests at the head table, the total annual sales of which exceed two million dollars, and that that sum represented only a fraction of the total textile volume.

Mr. Carvin drew attention to the recent gift of the Edgar and Emily Hesslein Fund, Inc., in presenting the Institute with a new Library building as an example of the generous cooperation which would be forthcoming to a well presented Appeal based on sound planning and constructive action.

• Cyanamid Appointment

R. H. Drukker has been appointed Sales Manager of the Philadelphia territory, for the Textile Resin Department, of American Cyanamid Company. T. B. Spence, formerly located at Bound Brook, New Jersey, has been assigned to work under Mr. Drukker's direction in that territory, which includes Pennsylvania, Delaware, Maryland, West Virginia, and northern Virginia.

D. G. Zachary, also of Bound Brook, has been assigned to the metropolitan territory which, as recently announced, is managed by R. M. Fisher.



Present at P.T.I. Alumni Club of New York Annual Fall Dinner: Merwin R. Haskel, William N. O'Donovan, Emil R. Pohlers, Charles W. Carvin, M. C. Edwards, Robert L. Huffines.

OBITUARY

WILLIAM G. BECKERS

DR. WILLIAM G. BECKERS, well known in the dyestuff manufacturing industry, died on November 3rd at his home in New York. He was 74.

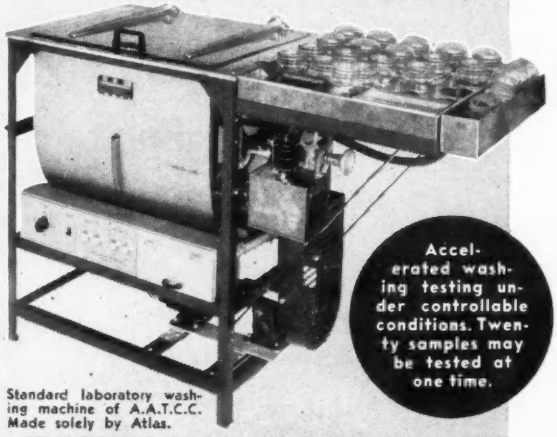
Born in Germany, Dr. Beckers attended a technical institute at Aix la Chapelle, Heidelberg University and received his Ph.D. from the University of Freiburg in 1897. He served as a lieutenant in the German army and then went to the Royal Dye School, Crefeld, as Associate Professor of Chemistry. In 1900 be became associated with the Bayer Company at Elberfeld. Two years later he took charge of the technical departments of the firm's American branch and became an American citizen in 1911. The same year he founded the Beckers' Aniline and Chemical Works in Brooklyn of which he was president and chairman of the board of directors. In 1917 his company consolidated with others to form the National Aniline and Chemical Company, Inc. of which he became a vice-president and a director. When National Aniline became a division of the Allied Chemical and Dye Corporation he was named a director which position he held at the time of his death.

Dr. Beckers had been a director of the Murray Hill Trust Company, Bolton National Bank, Aviation Corporation, Canadian Colonial Airways, Inc., and the Goodyear-Zeppelin Corporation. He was a trustee of the Brooklyn Polytechnic Institute. Since his retirement in 1919 he carried on chemical research and held a number of patents.

He was a member of the American Chemical Society, Society of Chemical Industry, Chemists' Club, Lawyers' Club, and Sigma Xi. He was formerly president of the Lake George Club and the Sagamore Golf Club at Lake George and had been active in the Lake George Association. Bolton was at one time called Beckersville for him and he once was owner of the Sagamore Club Hotel on Green Island, Lake George. He had been a member of the Montauk and Riding and Driving Clubs in Brooklyn and the Aviation Country Club on Long Island.

LAUNDER-OMETER

for Washing Tests—Mechanical Action—Color Fastness and Staining Tests—Detergent Tests—Fastness to Fulling Tests—Leather Dyeing Tests—Dry Cleaning Tests—Vat and Sulphur Dye Tests—General Laboratory Use—Shrinking Tests.



Accelerated washing testing under controllable conditions. Twenty samples may be tested at one time.

Standard laboratory washing machine of A.A.T.C.C. Made solely by Atlas.

ATLAS ELECTRIC DEVICES CO., 361 W. Superior St., Chicago

ATLAS-OMETERS

WEATHER-OMETER ★ LAUNDER-OMETER ★ FADE-OMETER

QUALITY **RICHMOND** PRODUCTS

ATTENTION HOSIERY DYERS

use

DYETEX

FOR BETTER SCOURING AND DYEING

DYETEX for boiling off and dyeing nylon hosiery more effectively and economically than soap.

DYETEX not only removes size and coning oils easily, but also needle oils, residues from needle cleaners, etc., are removed. In addition, they are held in solution so that when a scour bath is dropped, the residues drop with it.

DYETEX in dye baths, acts as a dispersing and levelling agent. While it will not do the work of a dyer, it will make his work easier.

SAMPLES AND MORE DETAILED INFORMATION UPON REQUEST

Southern Office
617 JOHNSTON BLDG., CHARLOTTE, N. C.
CHARLOTTE 2-1428

RICHMOND OIL, SOAP & CHEMICAL CO., Inc.
1041-43 FRANKFORD AVE., PHILADELPHIA 25, PA.

COMMONWEALTH COLOR & CHEMICAL CO.

More than forty years' experience in the manufacture of Chemical Specialties, Dyestuffs and Dyewoods for the Textile and Allied Trades . . .

MAIN OFFICE AND WORKS,
NEVINS, BUTLER and BALTIC STREETS, BROOKLYN 17, N. Y.
PHILADELPHIA • CHICAGO • GLOVERSVILLE • MONTREAL

ACID ALIZARINE BLUE B — Pr. 93

ALIZACHROME BLUE BLACK B — C.I. 1085

recommended for

ARMY and AIR CORPS DRESS UNIFORMS

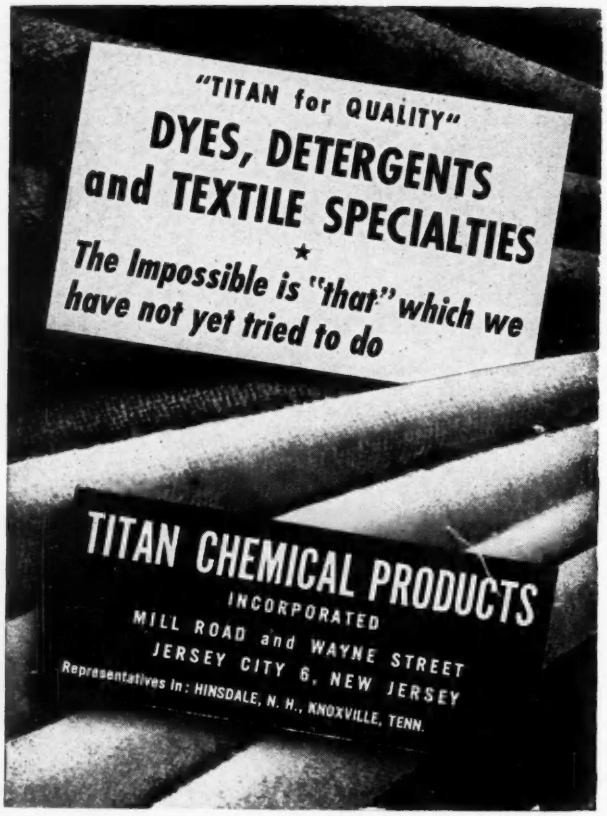
Our laboratories are always at your service

ZINSSER & COMPANY, Inc.

ESTABLISHED 1897

Manufacturing Chemists

HASTINGS-ON-HUDSON NEW YORK


"TITAN for QUALITY"
DYES, DETERGENTS and TEXTILE SPECIALTIES
★
The Impossible is "that" which we have not yet tried to do
TITAN CHEMICAL PRODUCTS
INCORPORATED
MILL ROAD and WAYNE STREET
JERSEY CITY 6, NEW JERSEY
Representatives In: HINSDALE, N. H., KNOXVILLE, TENN.

ANILINE OIL

•

CRESYLIC ACID

•

XYLIDINE

COALTAR CHEMICALS CORPORATION

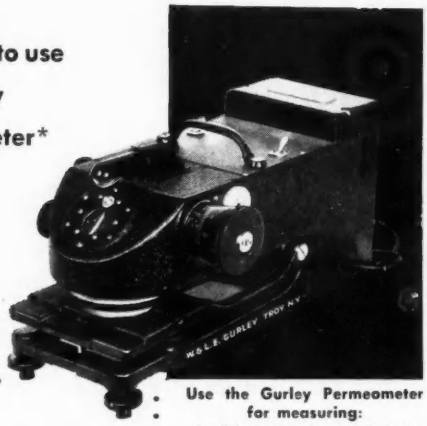
William D. Neuberg, President

GRAYBAR BLDG., 420 LEXINGTON AVE., NEW YORK 17, N.Y.

TELEPHONE: MURRAY HILL 5-9508

CABLE: "COALTARKEM"

Ten ways to use the Gurley Permeometer*



Here's the versatile instrument for quickly and accurately measuring air permeability of fabrics which permit passage of from 1 to 400 cubic feet of air per square foot area at a pressure drop of 0.5" of water. Write for Bulletin No. 1600. W. & L. E. Gurley, 512 Fulton, Troy, N. Y.

GURLEY

Scientific Instrument Makers Since 1845

*Conforms to ASTM "Tent. Meth. of Testing for Air Permeability of Text. Fabrics" D737-43T.

Use the Gurley Permeometer for measuring:

1. *Wind-proofness* of cloth.
2. *Quality* of filter cloth.
3. *Use requirement* of cloth intended to resist or pass air.
4. *Water-resistant* properties.
5. *Coolness* or *warmth* of clothing material.
6. *Construction* of cloth.
7. *Penetration* into cloth of various coatings.
8. *Retention of fillers, starch and sizing* in cloth after laundering or cleaning.
9. *Compactness, nap* or *fiber arrangement* in cloth after fulling, washing, sizing or other treatments.
10. *Amount of wear* after abrasion tests.

Have you ordered a Binder for your Reporter copies?

Maroon leatherette, gold lettered, large enough to hold twenty-six issues, only $3.50 post-paid.

Please send check with order to:

AMERICAN DYESTUFF REPORTER

ONE MADISON AVENUE

New York 10, N. Y.

QUALITY **RICHMOND** PRODUCTS

RICHSPIN

THE OIL FOR

WORSTED and WOOL SPINNING

Emulsifies very easily and completely

- Cuts static to a minimum
- Scours out completely
- Does not oxidize
- Contains no mineral oil
- Does not turn rancid
- Lubricates the fibre
- Penetrates through

RICHSPIN may be emulsified with any mild alkali. Borax does very well.

Samples and More Detailed Information Upon Request

Southern Office

617 JOHNSTON BLDG., CHARLOTTE, N. C.
CHARLOTTE 2-1428

RICHMOND OIL, SOAP & CHEMICAL CO., Inc.

1041-43 FRANKFORD AVE., PHILADELPHIA 25, PA.

QUALITY L R Co. PERFORMANCE

We EXPORT . . .

DYESTUFFS

In spite of recent price increases almost throughout the entire industry, we have managed, in most instances, to maintain our old price schedules.

We adhere scrupulously to the standards of quality and service which our many friends abroad have been accustomed to expect from us.

Ever ready for new connections of a constructive character, we solicit specific inquiries from interested consumers.

L. L. RONA & CO., INC.

Established 1929

40 Exchange Place
New York 5, N. Y.

Cable Address
"ELRONA"

PENETRANTS • DETERGENTS • SOFTENERS • REPELLENTS • FINISHES

BURK-SCHIER

BURKART-SCHIER CHEMICAL CO., CHATTANOOGA, TENN.

• CLASSIFIED ADVERTISEMENTS •

TECHNICAL SERVICE: TO ASSIST IN SERVICING FATTY CHEMICALS AND TEXTILE SPECIALTIES. DESIRE ADVANCED DEGREE OR EQUIVALENT IN TECHNICAL SERVICE OR SIMILAR EXPERIENCE. TO BE LOCATED IN CINCINNATI AREA AND INVOLVE SOME TRAVELING. AGE 25-35. IN REPLY PROVIDE RESUME INCLUDING EDUCATION, EXPERIENCE. APPLY EMERY INDUSTRIES, 4206 CAREW TOWER, CINCINNATI, 2, OHIO. ATT: PERSONNEL ASSISTANT.

WANTED: Chief Chemist. Large dyeing and printing firm in the Metropolitan Area requires the services of a chemist with broad experience to head their laboratory and to assist their production staff. Write Box No. 534.

POSITION WANTED: Experienced hosiery dyer, familiar with dyeing and bleaching of hosiery made from any kind of fiber. Capable of taking full charge of the Dye House. Write Box No. 531.

OPPORTUNITY FOR TEXTILE CHEMICAL SPECIALTY SALESMAN. The man we are looking for is at present employed, has had ten years or so successful experience in the building up of a following either in New England, Southern territory, or Pennsylvania. To such a man we offer an opportunity of a connection with a progressive, well equipped and financially sound manufacturer of a complete line of textile chemical specialties. To the right man we offer a liberal drawing and commission arrangement with a chance to obtain an interest in our business. Write Box No. 514.

TEXTILE CHEMIST: Well established manufacturer NYC area seeking textile chemist with extensive knowledge and experience in manufacture and development of textile auxiliaries. Knowledge of dyeing and finishing preferable. Excellent prospects for right man. Write Box No. 420.

POSITION WANTED: B.S. CH.E. M.S. Excellent development and production experience in textile chemicals —detergents, softeners, aqueous and emulsion finishing resins, water-fire and crease proofing compounds, printing pigments, binders, gums, emulsifying agents, related products. Extensive background in all types synthetic resins. Capable and cooperative. Write Box No. 530.

PRINTING MACHINE—TWO COLOR—44 INCH CYLINDER. CAN BE SEEN IN OPERATION. WRITE BOX NO. 532.

POSITION WANTED: As Technical Sales Representative. Over twenty years experience all types dyeing on variety of fibres. Extensive experience standardizing dyestuffs and evaluating new research products. Would consider responsible position including laboratory supervision combined with technical sales work. Write Box No. 538.

SALESMAN WANTED: Position is open in New England territory for a progressive man with technical and sales experience in textiles. All replies will be treated in strict confidence. Write Box No. 543.

POSITION WANTED: Textile Technologist—Excellent background in chemistry, mathematics and physics. 4½ years in charge of program to develop new water resistant fabrics, test methods and methods of applying water repellent compounds. Has overall picture of the water repellency field from a research and practical standpoint. Familiar with textile test methods and their interpretation. Can set up control laboratory or direct research in the field of water repellency. Write Box No. 546.

WANTED: 50 or 100 Lb. PACKAGE DYEING MACHINE.

WRITE BOX NO. 548

• CLASSIFIED ADVERTISEMENTS •

The rate for "Position Wanted" advertisements in this column is 2 cents a word—with a minimum of 50 cents per insertion. For all other types of advertisements—i.e., help wanted, machinery wanted or for sale—the rate is $7.50 per column inch or less per insertion.

WANTED: By prominent textile organization, expert dyer familiar with pads and continuous dyeing machines. Must be rapid and accurate color matcher. Write Box No. 547.

WANTED: Young energetic man to represent progressive chemical auxiliary manufacturing company in the following territories: Pennsylvania, Maryland and Delaware. Preferably a resident of Philadelphia. Technical background is necessary. Replies will be treated in strict confidence. Write Box No. 544.

OPPORTUNITY—SALES REPRESENTATIVE

Fast growing progressive manufacturer with full line of textile chemical specialties offers exceptionally lucrative position to qualified sales representative in choice areas in South. Good sales record and working knowledge of textile processing mandatory. State age, training, experience and sales area desired. Stock purchase arrangement available upon demonstration of sales ability. Address in confidence, Charles P. Raymond Service, Inc., 294 Washington St., Boston 8, Mass., telephone Liberty 2-6547. Over fifty years confidential employment service for textile men.

WANTED: Experienced textile chemist for a manufacturing concern. Applicant must have extensive knowledge and experience in Textile Detergents and Specialties. Excellent opportunity for right man. State age, experience and education. Write Box No. 549.

WANTED: Salesman for textile detergents and specialties. Excellent opportunity for advancement with a growing firm. State age, experience and education. Write Box No. 540.

A WELL-ESTABLISHED dyeing and printing plant has an opening for a practical finisher of all types of silk and synthetic prints and plain dyes. Only a well qualified, well educated, and broadminded man possessing mechanical and technical experience, capable of handling men and diversified equipment should apply. Salary commensurate with ability. Write Box No. 541.

POSITION WANTED: Boss Dyer, capable of taking full charge of Dye House. Many years of experience in the dyeing of raw stock, woolen worsted skeins, cotton and rayon, shoddy and tubular knit fabric. Write Box No. 542.

POSITION WANTED: Textile technician with 25 years experience in various positions of responsibility in Dyeing, Finishing and Printing of all types of Rayon, Silk and their mixtures. Familiar with the requirements of the dress and menswear trade in New York as well as contact between customer and plant. 18 years with one firm. Write Box No. 550.

TEXTILE CHEMIST

For research on the application of chemicals for textile protection. Must be thoroughly grounded in textile chemistry and natural fiber structure. Please address:

Technical Employment Manager.
Merck & Co., Inc.
Rahway, New Jersey.

OFFERING—CAREER.

To a young man, in the Metropolitan area, with some knowledge and experience in dyeing and finishing. A fast growing progressive chemical manufacturer requires wide-awake representation. Salary.

Write Box No. 510

POSITION WANTED: Foreman Dyer, Chemist Lowell Textile Institute graduate 1943. Experienced narrow fabrics and piece goods including spun rayons, acetates, wool-rayon blends. Also laboratory experience. Now employed as Foreman Dyer at nationally known synthetic piece goods plant. Executive caliber. Metropolitan area preferred. Veteran. Write Box No. 551.

SALES POSITION OPEN. Chemical manufacturing company desires the services of a representative for the Canadian area. Applicant must have a sound technical background in textiles. All replies strictly confidential. Write Box No. 545.

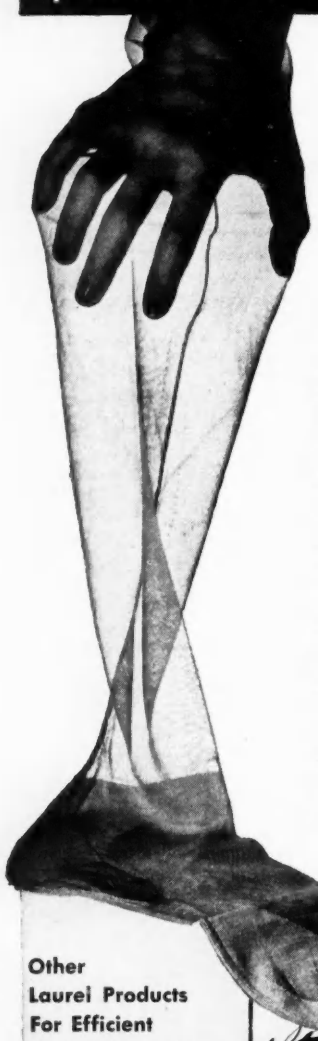
TEXTILE RESEARCH CHEMIST POSITION AVAILABLE FOR CHEMIST WITH SEVERAL YEARS TEXTILE CHEMICAL RESEARCH EXPERIENCE. REQUIRED GOOD WORKING KNOWLEDGE OF TEXTILE PROCESSES PREFERABLY OF GENERAL NATURE. POSITION INVOLVES DEVELOPING AND EVALUATING PRODUCTS FOR PROCESSING AND FINISHING TEXTILES MAINLY LABORATORY WORK. BUT SOME FIELD EVALUATION. IN REPLY PROVIDE DETAILED RESUME OF EDUCATION AND EXPERIENCE, PERSONAL DATE, SALARY DESIRED. APPLY EMERY INDUSTRIES, 4206 CAREW TOWER, CINCINNATI 2, OHIO. ATT. PERSONNEL ASSISTANT.

POSITION WANTED: Textile Chemist, B.S. in Chemistry, 30, family, five years diversified laboratory and field experience in product development and technical service. Extensive knowledge of processing, finishing and coating. Seeking responsible position with progressive firm. Write Box No. 552.

TRY A CLASSIFIED!

Increased Snag-resistance for your fine denier nylon hosiery—

with LAUREL *Peramel* #5



Laurel Peramel #5 safeguards the beauty and appeal of your fine denier nylon hosiery. Laurel Peramel #5 is an efficient, non-toxic resin finish. Long lasting, it increases snag resistance, keeps pulled threads to minimum, improves the stitch and appearance of your nylons. Laurel Peramel #5 speeds your production, pleases your customers. Introduced to the textile industry in early 1940, Laurel Peramel #5 has become a "must" today with leading nylon processors.

Write now for trial order and simple directions for use.

Other Laurel Products For Efficient Nylon Processing

- Laurel Coning Oil #443
- Laurel Nynit C
- Laurel Supergel
- Laurezol #6
- Laurel Degumming Compounds
- Laurel Dull Finishes
- Laurel Water Repellents

soaps, oils, finishes

LAUREL SOAP MANUFACTURING CO., Inc.

Wm. H. Bertolet's Sons

ESTABLISHED 1909

Warehouses:
Paterson, N. J. Chattanooga, Tenn. Charlotte, N. C.

Offices:
2601 East Tioga Street
Philadelphia 34, Pennsylvania

• INDEX TO ADVERTISERS •

Alco Oil & Chemical Corp.	
Althouse Chemical Co., Inc.	Second Cover
Amalgamated Chemical Corp.	
American Aniline Products, Inc.	VII
American Cyanamid Co. (Ind. Chem. Div.)	Back Cover
American Dyewood Company	
American Key Products, Inc.	
Arkansas Company, Inc.	VIII
Armour & Co.	
Arnold, Hoffman & Co., Inc.	IV
Atlantic Chemical Co., Inc.	XIII
Atlantic Refining Company, The	IX
Atlas Electric Devices Co.	XIX
Barry Chemical Co.	
Becco Sales Corp.	
Bick & Co., Inc.	XXV
Blackman-Uhler Co., Inc.	
Blickman, Inc., S.	
Burkart-Schier Chemical Co.	XXII
Butterworth Sons Co., H. W.	XXVI
Calco Chemical Division, American Cyanamid Co.	
Calgon, Inc.	
Camobell & Co., Inc., John	
Carbic Color & Chemical Co., Inc.	XVI
Carbide & Carbon Chemicals Corp.	
Chem-Col Co., Inc.	
Ciba Company, Inc.	
Clover Chemical Co.	
Coaltar Chemicals Corp.	XX
Colgate-Palmolive-Peet Co.	
Commonwealth Color & Chemical Co.	XIX
De Paul Chem. Co., Inc.	
Drew & Co., Inc., E. F.	
Du Pont de Nemours & Co., E. I. Dyestuff Division	Front Cover
Fancourt & Co., W. F.	XII
Geigy Company, Inc.	
General Chemical Division, Allied Chemical & Dye Corp.	
General Dyestuff Corp.	
Girdler Corp., The	
Grinnell Co., Inc.	
Gross & Co., A.	
Gurley, W. & L. E.	XXI
Hardesty Co., W. C.	
Hart Products Corp.	
Hercules Powder Co.	
Heyden Chemical Corp.	
Hooker Electrochemical Co.	
Houghton & Co., E. F.	
Interchemical Corp., Textile Colors Div.	
International Nickel Co., Inc.	
International Salt Co., Inc.	
Kelco Co.	XI
Koppers Co., Inc.	
Laurel Soap Mfg. Co., Inc.	XXIV
Leatex Chemical Co.	
Leeds & Northrup Co.	
MacBeth Corp.	
Maher Color & Chemical Co.	
Mathieson Chemical Corp.	
Maywood Chemical Works	
Monsanto Chemical Co.	XIV, XV
National Aniline Division, Allied Chemical & Dye Corp.	IX
National Carbon Co., Inc.	
Napco Chemical Co.	
Nova Chemical Corp.	
Nyanza Color & Chemical Co.	
Onyx Oil & Chemical Co.	XVIII
Orleans Co., Inc.	
Pabst Sales Company	
Perkins & Sons, Inc., B. F.	
Peuchot Color & Chemical Co.	
Procter & Gamble	
Refined Products Corp.	III
Richmond Oil Soap & Chemical Co., Inc.	XIX, XXI
Riggs & Lombard, Inc.	XXV
Rohm & Haas Company	
Rona & Co., Inc., L. L.	XXI
Royce Chemical Co.	
Rumford Chemical Works	
Sandoz Chemical Works, Inc.	
Scholler Bros., Inc.	Third Cover
Sindar Corp.	
Smith, Drum & Co.	
Socony-Vacuum Oil Co., Inc.	
Solvay Sales Div., Allied Chemical & Dye Corp.	
Sonneborn Sons, Inc., L.	
Standard Brands, Inc.	
Standard Chemical Products, Inc.	
Stein Hall & Co., Inc.	
Tennessee Eastman Corp.	
Titan Chemical Products, Inc.	XX
Truitt Mfg. Co.	
Union Carbide & Carbon Corp.	
United Chemical Prod. Corp.	
Van Vlaanderen Machine Co.	V
Vellner, Eugene	
Virginia Smelting Co.	
Wallerstein Co., Inc.	
Warwick Chemical Co.	
Watson-Park Company	VI
Wolf & Co., Jacques	
Young Co., J. S.	
Young Aniline Works	
Zinsser & Co., Inc.	XX
Zurn Co., O. F.	

DYESTUFFS
BICK & CO., INC.
READING, PA.
CHEMICALS

Elementary
Organic Chemistry
by DR. LOUIS A. OLNEY

Now Available at

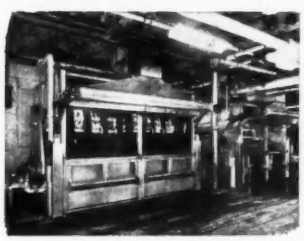
$2.00 per copy

TEXTILE ASSOCIATES, INC.
LOWELL TEXTILE INSTITUTE
LOWELL, MASSACHUSETTS

The Fleet Line
OF FINISHING EQUIPMENT

TLBT
PIECE DYE
KETTLE

An Extremely VERSATILE Machine



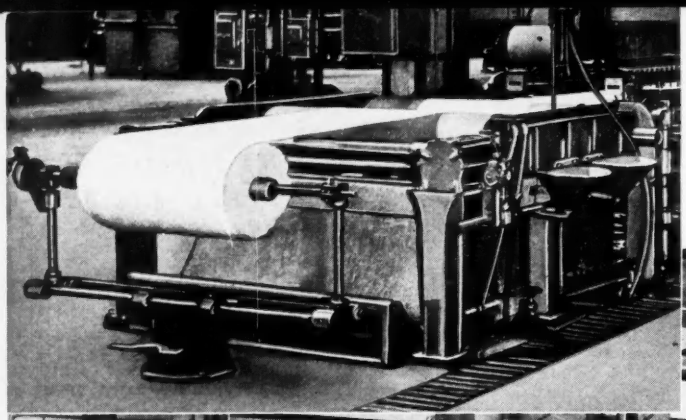
Heavy Woolens at Putnam Woolen Corp.

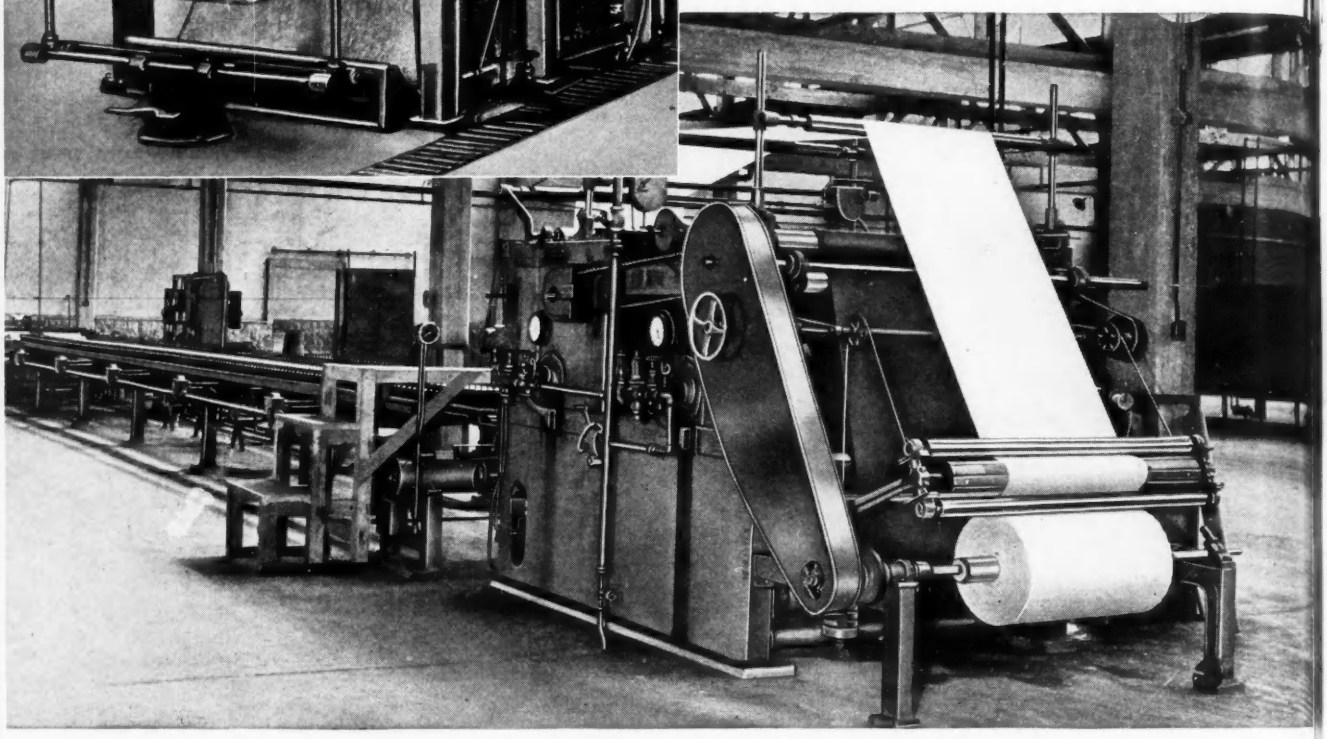
OTHER USES ARE:
Plushes in a New England mill—Men's Wear at Lymansville Co.—Heavy Knitted Fabrics at Draper Bros. Co.—Blankets at North Star Woolen—Women's Wear at Gonic Manufacturing Co.

OTHER ADVANTAGES
- Tangles, tie-ups, wrinkles, creases and dye streaks virtually eliminated.
- Knurled drum reel absolutely eliminates slip, even on rayon gabardines.
- Dyestuff savings up to 10% compared with other stainless kettles, more with wooden types.

Circular on request

RIGGS AND LOMBARD
INCORPORATED
FOOT OF SUFFOLK ST., LOWELL, MASS.





Why Butterworth Builds a Palmer Range *this* way

Take a practical mill man's word for it—the latest type Butterworth-built Palmer Finishing Range gives more production and better tension control than ever before possible. It includes these Butterworth Machines:

(a) 4-roll horizontal Pad or Quetsch;
(b) 60-foot straight automatic Tenter with automatic rail guiders at entering end;
(c) Palmer finishing unit with 60-inch diameter Cylinder and Winder.

This high-speed range is driven by AC-DC generator set with individual motors on Pad and Tenter. There are specially designed tension controls between each unit.

We built this latest-type Palmer Range with practical mill men offering suggestions and criticism at every stage. It put our design department on the spot—but we like it that way. And so do our customers.

Let us tell you about the results in terms of increased production and better finishing.

Butterworth

H. W. BUTTERWORTH & SONS CO., Phila. 25, Pa.

PROVIDENCE DIVISION, Providence, R. I. - 1211 Johnston Bldg., Charlotte, N. C. - W. J. Westaway Co., Hamilton, Ont. - ARGENTINA: Storer & Cia., Buenos Aires - AUSTRALIA: Noel P. Hunt & Co., Ltd., Melbourne - BELGIAN CONGO: Paul Pflieger & Co. - BOLIVIA: Schneiter & Cia., Ltda., La Paz - BRAZIL: Cia. Industria e Commercia, Sao Paulo e Rio de Janeiro - CHILE: Schneiter & Cia., Ltda., Santiago - COLOMBIA: C. E. Halaby & Co., Medellin - CUBA: Thos. F. Turrull, Havana - ECUADOR: Richard O. Custer, S. A., Quito - FRANCE: Georges Campin, Le Perreux, Seine; Rene Campin, Sceaux, Seine - MEXICO: Slobotzky, S. A., Mexico, D. F. - MIDDLE EAST, MEDITERRANEAN, BALKANS, AUSTRIA, HUNGARY, CZECHOSLOVAKIA, INDIA: Arlind Corporation - NORWAY: Dr. Ing. Otto Falkenberg, Oslo - PERU: Custer & Thommen, Lima - SOUTH AFRICA: Texmaco, Johannesburg - SWEDEN: Elof Hansson Goteborg - URUGUAY: Storer & Cia., Ltda., Montevideo - VENEZUELA: Herbert Zander & Co., Caracas.

SHADES OF VENUS

The ancient Greek "glamour girl" had few of the "adornments" available to her modern counterpart of 1948. Incidentally, we doubt if she was really more beautiful or alluring; certainly, she never had sheer, soft, smoky-dull hosiery to encase those shapely legs (lovely hosiery, made even more lovely by *DuraBeau Finishes*).

DuraBeau Finishes, in addition to *beautifying*, impart the famous "*film of protection*," which assures *added resistance* to spots, snags and runs,—thus, giving the lady of 1948 "miles more wear" per pair.

DuraBeau
Reg. U. S. A. and Canada
TEXTILE FINISHES

SCHOLLER BROS., INC. Mfrs. of Textile Soaps, Softeners, Oils, Finishes • Collins & Westmoreland Sts., Phila. 34, Pa. • St. Catharines, Ont., Can.

IN A WIDE VARIETY OF TEXTILES...

PARAMUL 115

WATER REPELLENT

PARAMUL® 115 Water Repellent, – another important development of Cyanamid Research for the textile industry – has a double purpose in life: to provide a better water repellency and a superior resistance to water borne stain. And how *well* it does *both* is proved many times a day in a wide variety of fabrics – cottons, rayons, linens and woolens – for outerwear and equipment purposes.

An aqueous solution of wax and aluminum salts, PARAMUL 115 Water Repellent saves time and money in application, is easy to use, odorless and harmless to skin and fabric. It provides complete stability over a wide range of temperatures and can be safely stored for a long time.

Take advantage of Cyanamid's expert technical staff to achieve the best results *possible* in renewable water repellency and renewable stain resistance.

AMONG CYANAMID PRODUCTS FOR THE TEXTILE INDUSTRY ARE:

AQUASOL® Sulfonated Castor Oils; NO-ODOROL® Finishing Oils; DECERESOL® Wetting Agents; PARAMUL® 115 Water Repellent; Penetrants, Softeners, Finishes, Sizing Compounds, and other specialties and Heavy Chemicals. For low-cost chemical equivalent of distilled H_2O . . . FILT-R-STIL® Demineralizing Units.

®Reg. U. S. Pat. Off.

★ ★ ★

SALES OFFICES: Boston, Mass.; Philadelphia, Pa.; Pittsburgh, Pa.; Baltimore, Md.; Charlotte, N. C.; Cleveland, Ohio; Cincinnati, Ohio; Chicago, Ill.; Detroit, Mich.; Kalamazoo, Mich.; St. Louis, Mo.; Los Angeles, Calif.; San Francisco, Calif.; Seattle, Wash. In Canada: Dillons Chemical Co. Ltd., Montreal and Toronto.

American Cyanamid Company

Industrial Chemicals Division

30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.